Introduction

GE HealthCare's Revolution Maxima is a new standard computed tomography, powered by artificial intelligence technology that delivers a streamed line workflow for better ease of use and operational efficiency.

- TrueFidelity™ deep learning imaging reconstruction*
- Smart Flow
- 2.2 40 mm coverage Clarity Detector /DAS
- 0.35 sec* rotation speed
- 0.28 mm spatial resolution[1]
- ASiR-V*, up to 82% dose reduction relative to FBP at the same image quality[2+]
- EHL connectivity to support Spine Auto View* or other advanced applications.

Key technologies enablers include:

Deep Learning Image Reconstruction is the next generation image reconstruction technology that uses a dedicated Deep Neural Network (DNN) to generate TrueFidelity™ CT Images. Compared to current iterative reconstruction technology, TrueFidelity™ CT Images can elevate every image to a powerful first impression with distinguished image quality performance[3], and preferred image sharpness[4] and noise texture[5], at the same dose.

AI based automatic patient positioning is an innovative, next generation technology. It is powered by Xtream camera that enables automatic landmark detection and auto patient centering. This function helps optimize the radiation dose and image quality and it may avoid the positioning error.

Avoid a wrong scout scan by matching the direction of the patient orientation (head first, feet first, prone and supine) captured with Xtream camera and the selected protocol information.

Related Protocol matches an order information transferred from RIS (Radiology Information System) with a user protocol and shows only necessary protocols to reduce complexity of protocol selection.

Clarity imaging chain with new X-ray tube, Detector and IR technology overcome Image performance challenges such as noise, spatial resolution, low contract detectability or artifact.

Performix 40 Plus with liquid bearing tube realizes 0.35 sec* rotation speed in routine and enables 6 sec in 1000 mm, combined with high helical pitch 1.531.

ASiR-V* is an advanced model based iterative reconstruction technology, which can reduce the image noise by utilizing the models of the system noise statistics, objects, and physics.

SnapShot Freeze* is designed to reduce blurring artifacts due to motion in coronary vessels that cannot be addressed by gantry speed alone. Providing up to a 6X improvement, while maintaining high spatial resolution.[6]

SnapShot Pulse* mode is for low dose imaging of the coronary arteries. SnapShot Pulse can also be used to image structures that are near to the heart and may be affected by heart motion such as thoracic aorta's or pulmonary arteries.

Organ Dose modulation provides reduction of radiation dose via X-ray tube current modulation for superficial tissues, such as breasts. ODM may enable equivalent pixel noise standard deviation without decreasing productivity as with the use of conventional superficial dose reduction techniques.

Volume Helical Shuttle* is a continuous scan technique that is a bi-directional scan mode, covers up to 312.5 mm for 4D imaging.

Smart MAR* helps reducing photon starvation, beam hardening and streak artifacts caused by metal in the body, such as hip implants.

Indications for use

1. The system is intended to produce cross-sectional images of the body by computer reconstruction of x-ray transmission data taken at different angles and planes, including Axial, Cine, Helical (Volumetric), Cardiac, and Gated acquisitions. These images may be obtained either with or without contrast. This device may include signal analysis and display equipment, patient and equipment supports, components and accessories.

This device may include data and image processing to produce images in a variety of trans-axial and reformatted planes. Further the images can be post processed to produce additional imaging planes or analysis results.

The system is indicated for head, whole body, cardiac and vascular X-ray Computed Tomography applications in patients of all ages.

The device output is a valuable medical tool for the diagnosis of disease, trauma, or abnormality and for planning, guiding, and monitoring therapy.

TrueFidelity™ Imaging

TrueFidelity™ deep learning imaging reconstruction*

Deep Learning Image Reconstruction is the next generation image reconstruction technology that uses a dedicated Deep Neural Network (DNN) to generate TrueFidelity™ CT Images. Compared to current iterative reconstruction technology, TrueFidelity™ CT Images can elevate every image to a powerful first impression with distinguished image quality performance[3], and preferred image sharpness[4] and noise texture[5], at the same dose.

TrueFidelity™ Images have the potential to improve the reading confidence in a wide range of clinical applications such as head, whole body and cardiovascular, for patients of all ages.

The user can select three strengths of Deep Learning Image Reconstruction: Low, Medium or High. The strength selection will vary based on user preference in specific clinical applications.

Smart flow

Auto Positioning* 7.

With a current traditional scanner, an operation for patient positioning requires some manual settings such as scan range determination, centering or landmark setting, and challenges are time-consuming and variation by operators. On the other hands, Auto Positioning activates automatic table elevation motion to the centering height, and cradle motion to the scout start position, with one single click on the touchscreen. Moreover, it safeguards the positioning motion by checking possible collision of the patient body with the CT gantry. Auto Positioning with AI technology realizes the auto scout scan range, anatomical reference detecting and centering by specifying the position and shape in three dimensions. This GE HealthCare's unique technology provides better patient throughput, ease of use, consistent image quality, standardization, and less error.

- Auto Positioning loads patient to the scan position with just one click. It provides better operational efficiency compared without this function.
- Auto centering optimizes the radiation dose and image quality, and it helps in minimizing positioning errors compared to manual positioning.
- Avoid a wrong scout scan by matching the direction of the patient orientation (head first, feet first, prone and supine) captured with Xtream camera and the selected protocol information.

Xtream Camera*

AI based automatic patient positioning is an innovative, next generation technology. It is powered by Xtream camera that enables automatic landmark detection and auto patient centering.

The Xtream camera captures patient information, then uses a dedicated AI algorithm to detect the anatomical landmark automatically based on protocol input.

The Xtream camera provides automatic patient centering by determining the patient center within the scan range and aligning this patient center with CT isocenter automatically.

Xtream Tablet

Xtream Tablet is a multi-purpose user interface on gantry sides and supports following features.

- Wide monitor: 12.1 inch
- Touch screen operation
- Patient and protocol selection
- Patient information display
- Motion axes display
- Related Protocol
- Default Patient Positioning
- Scout scan range setup and confirmation
- ECG waveform display
- Collision indication
- Emergency Patient

Smart flow *(cont.)*

Remote Control Suite* with 3-Video Monitoring System

The Remote Control Suite is Remote Control Panel with Assisted Video Monitoring System. It is designed to remotely position patients from the scan control room, allowing the technologist to remain isolated from the patient while keep the ability to remotely start and end exam from the console room without going into the gantry room. Help to minimize potential contamination risk between gantry & console rooms. Remote Control Suite includes two main parts: Remote Control Panel, 3 Video Monitoring System.

The Remote Control Panel extends the CT scanner in-room control panel function to the operator desktop. Technologists can control table up/down, cradle in/out, landmark setting, one button loading and one button unloading patient without entering into scan room.

3-Video Monitoring System with three high resolution cameras, CCTV 21.6 inch 16:9 monitor and computer, is to assist the technologists for real time observing the landmark laser line and patient status from operation room.

Remote Auto Positioning*

Remote Auto Positioning is GE HealthCare unique technology. Combined with GE HealthCare Remote Control Suite and AI technology, it helps technologist to use auto patient positioning function remotely from operator room, to realize the auto scout scan range, anatomical reference detecting and centering by specifying the position and shape in three dimensions.

Related Protocols

Matches an order information transferred from RIS (Radiology Information System) with a user protocol and shows only necessary protocols. These protocols are showed on the gantry side Xtream Tablet and contribute to the shortening of scanning preparations.

Volume helical digital tilt

Volume helical digital tilt is an innovation in image reconstruction technology that allows clinicians to reconstruct tilted views of up to ±30 degrees without the need for physically tilting the scanner. Digital tilt uses a resampling technology within the reconstruction pipeline to map vertical data samples to user specified tilted view angle.

Digital tilt exams are efficient since operators can setup the entire workflow from their console without the need for multiple trips between console and gantry controller.

With helical scanning of a volume, clinicians have the additional advantage of leveraging powerful post processing and visualization tools for creating volume rendering, multiplanar reformatting (MPR), curved MPR views and any tilted images as needed.

Barcode Reader on Gantry*

The Barcode Reader is fully integrated into the gantry and it allows operators to scan patient information or protocols on the gantry side. This unique function realizes a simple and faster workflow.

Clarity Imaging Chain

Revolution Maxima's Clarity Imaging Chain consists of Clarity Detector, DAS, Performix 40 Plus X-ray Tube and ASiR-V reconstruction, to deliver high resolution imaging.

For better performance Volume CT, Clarity Imaging Chain provides enhancement of spatial resolution up to 20% compared with previous GE HealthCare technology[7].

Clarity Detector and Data Acquisition System 2.5

- Designed as analog cable free between ASIC and Diode and has a capability to reduce electric noise.
- Designed for less heat generation, up to 90% compared with previous GE HealthCare technology and all in one DAS / Detector. It has capability to reduce electric noise.
- Designed for less floor-noise, up to 44% compared with previous GE HealthCare technology and it has capability to reduce electric noise.
- Optimized collimator with ability to reduce scatter noise.

Performix™ 40 Plus X-ray Tube 3.1

- Performix 40 Plus X-ray tube provides less focus movement.
- A liquid bearing tube that has a capability of less -wear of Tube bearing and is enabled up to 0.35 sec rotation speed with a routine scan. Revolution Maxima allows users to utilize helical pitches up to 1.531 and 0.35 sec rotation speed that meets GE HealthCare's image quality specifications for lower pitch acquisitions. This high pitch and 0.35 sec rotation speed enables faster scan times which may allow for shorter breadth holds, and may help to avoid sedation, simultaneously (or "as well as") reducing motion artifacts from patient and organ movement. As an example, using this higher pitch, a full-body trauma scan of 1000 mm can be acquired in as little as 6 seconds.

ASiR-V™* 3.4.2

ASiR-V is the newest technology in GE HealthCare's family of industry-leading iterative reconstruction techniques.

ASiR-V allows healthcare providers to lower dose by 50 to 82% as compared to standard filtered back-projection (FBP) reconstruction at the same image quality+.

ASiR-V extends the advanced noise and dose reduction technologies of ASiR. Existing iterative reconstruction, such as ASiR, models the noise in a way that is adaptive to the mA, kV and body habitus of the patient.

ASiR-V enhances the noise modeling of ASiR in two ways:

1) ASiR-V performs sophisticated statistical modeling of the projection samples by taking into account the confidence of each projection measurement in the reconstruction process; and

2) ASiR-V incorporates the user's special clinical needs, such as enhanced spatial resolution, into the statistical treatment of the samples.

Clarity Imaging Chain *(cont.)*

ASiR-V™* *(cont.)*

Compared to ASiR, ASiR-V offers:

- Improved noise & dose performance beyond what is possible with ASiR.
- Improved spatial resolution without compromise in image noise.
- Reduced streak artifacts due to better handling of photon-starvation with its unique adaptive restoration algorithm.

Lower dose:
ASiR-V reduces dose by 50% to 82% relative to FBP at the same image quality[+]

Low contrast detectability improvement:
ASiR-V improves low contrast detectability by 59% to 135% at the same dose[+]

Image Noise improvement:
ASiR-V reduces image noise up to 91% at the same dose[+]

Spatial resolution enhancement:
ASiR-V improves spatial resolution up to 2.07X (107%) at same image noise[+]

Artifact reduction:
ASiR-V image reconstruction has the capability to reduce low signal artifact such as streak artifact compared to FBP[+]

Primary Benefit – Imaging Performance

ASiR™ (Adaptive Statistical Iterative Reconstruction)

- ASiR dose reduction technology: A reconstruction technology that may enable reduction in pixel noise standard deviation. The ASiR reconstruction algorithm may allow for reduced mA in the acquisition of diagnostic images, thereby reducing the dose required.[8]
- ASiR dose reduction technology: A reconstruction technology that may enable improvement in low contrast detectability.[8]
- When imaging the same object, the Revolution Maxima system with ASiR may deliver pixel noise standard deviation equivalent to a higher mA acquisition such as that delivered by a higher power generator.[8]
- The use of ASiR may allow for scanning at lower mA and less anode heat input, thereby reducing the likelihood of encountering tube cooling delays.[8]

Primary Benefit – Imaging Performance *(cont.)*

High helical pitch

Revolution Maxima allows users to utilize helical pitches up to 1.531 and 0.35 sec rotation speed that meet GE HealthCare's image quality specifications for lower pitch acquisitions. This higher pitch and 0.35 sec rotation speed enable faster scan times which may allow for shorter breadth holds, and may help to avoid sedation, simultaneously (or "as well as") reducing motion artifacts from patient and organ movement. As an example, using this higher pitch, a full-body trauma scan of 1000 mm can be acquired in as little as 6 seconds.

Smart metal artifact reduction (MAR) – Smart MAR* 4.2

Smart MAR* helps reducing photon starvation, beam hardening and streak artifacts caused by metal in the body, such as hip implants.

IQ Enhance (Pitch Booster)

IQ Enhance is a special algorithm that can be prescribed to minimize commonly seen in thin slice helical acquisition.

1024 matrix reconstruction 2.4

Revolution Maxima supports 1024 reconstruction matrix.

Ultra Kernel

Adaptive Enhance Level Adjustment (AELA) may improve visual spatial resolution while maintaining pixel noise standard deviation and without introducing new artifacts.

AAR – Advanced artifact reduction

Advanced Artifact Reduction (AAR) Filter significantly reduces streaking artifacts when highly absorbent objects are in the field of view – i.e. large shoulder.

Two Path Dual-Energy Acquisitions 2.5 6.

GE HealthCare's protocol management is improved with the addition of a workflow improvement feature, which allows easy configuration of back to back Axial or helical scans of the same anatomy at two different X-ray energies (kVps). To further improve registration accuracy, patient immobilization may be utilized. The additionally acquired dual energy data can be post-processed on console or AW workstation using Add/Sub function to gain additional clinical information.

Primary Benefit – Imaging Performance *(cont.)*

Overlapped reconstruction*

2.11 For 64ch based system, the overlapped reconstruction feature enables 128 slices per rotation in axial scanning modes and delivers improved Z-axis visualization performance relative to non-overlapped reconstruction.

For 32ch based system, the overlapped reconstruction feature enables 64 slices per rotation in axial scanning modes and delivers improved Z-axis visualization performance relative to non-overlapped reconstruction.

Conjugate Cone-Beam Back Projection

For 64ch based system, conjugate Cone-Beam Back Projection utilizes two sets of counter-opposed projections to provide 128 distinct projection measurements per rotation for axial and a helical acquisition mode to significantly improve Z-resolution.

For 32ch based system, conjugate Cone-Beam Back Projection utilizes two sets of counter-opposed projections to provide 64 distinct projection measurements per rotation for axial and a helical acquisition mode to significantly improve Z-resolution.

Thinner FWHM at Helical

GE HealthCare's exclusive helical reconstruction technologies, crossbeam correction, conjugate ray interpolation and hyper plane helical reconstruction with alpha smoothing method, allow scanning at thin slice 0.66 mm typically (40 mm aperture, 0.516 helical pitch).

Short geometry design

The "Short Geometry Design" improves geometry efficiency compared to conventional long geometry system. For example, Revolution Maxima' distance between the focus to the iso center is 541 mm. The distance in a conventional long geometry system is 600 mm. The geometry efficiency of Revolution Maxima is approximately 19% higher than that of long geometry scanner.

Primary Benefit – Advanced Dose reduction technology

Organ Dose Modulation 3.4.3

ODM provides reduction of radiation dose via X-ray tube current modulation for superficial organs and tissues, such as breasts while maintaining diagnostic quality without decreasing productivity (as the result of not using externally applied shields).

Because attenuation data from the Scan Projection Radiograph is used to determine the mA modulation for acquisitions using Automatic Exposure Control, it is understood that when using externally applied shields that these shields should not be put in place prior to acquiring the scan projection radiograph(s). Placement of externally applied shielding prior to obtaining the scan projection radiograph(s) may adversely affect the AEC performance.

3D mA Modulation utilizing SmartmA and AutomA 3.4.1

Having this kind of volumetric knowledge before you scan allows you to personalize protocols and optimize dose for every patient – large and small. During the scan, real-time, 3D dose modulation helps deliver consistent image quality because it automatically accounts for the changing dimensions of your patient's anatomy. 3D mA modulation acquisitions may reduce dose compared with fixed mA acquisitions.[9]

Dynamic Z-axis tracking

Dynamic Z-axis tracking provides automatic and continuous correction of the x-ray beam shape to block unused x-ray at the beginning and end of a helical scan to reduce unnecessary radiation.

Intervention

SmartView™*

SmartView provides continuous, real-time CT fluoroscopy at 24 fps (3 view ports at 8 fps each) with in-room viewing and manual X-ray control. The intuitive user interface provides six user-selectable display layouts, in-room image review and WW and WL control. Features ceiling-mounted in-room LCD monitor and full-featured handheld, cradle-mounted controller.

Real time performance

- FPS at single display mode: 12 fps
- FPS at three display mode: 24 fps
- Nominal image lag: 0.2 sec

Viewport	Slice thickness (mm)	Rotation speed (Sec)
Single	2.5, 5.0, 10	0.5*, 0.8, 1.0
Three	1.25, 2.5, 5.0	

SmartStep*

SmartStep is an interventional mode providing step-and-shoot imaging with in-room viewing and manual X-ray control.

The three interventional viewports automatically update each time an exposure is made with the foot pedal.

Biopsy mode

Biopsy Mode improves the efficiency of setting up and acquiring slices during a biopsy. All biopsy scan parameters are available on a single screen from which you can launch the biopsy scan

Dose reduction technology and management

Revolution Maxima introduces Volume CT capabilities while incorporating the following GE HealthCare dose reduction features.

OptiDose™

For years GE HealthCare has followed the ALARA principle in helping its customers optimize dose. GE HealthCare has provided many tools to help the clinician minimize dose while achieving diagnostic quality images.

- ECG mA Modulation*: For cardiac applications, prospective ECG mA modulation automatically adjusts the mA to minimize the patient's exposure to X-rays – reducing mA during systolic phases of the cardiac cycle. This provides clear images and allows you to reduce mA primarily in the systolic phases of the cardiac cycle – yet gives you enough power to obtain quality images for functional analysis.

Dose reduction technology and management *(cont.)*

OptiDose™ *(cont.)*

- CT 4Kids: The pediatric protocols are based upon a child's size, age, and weight and tailor the dose or treatment to the size of the patient. The Head and Orbit categories are age based. The rest of the categories are height and weight-based protocols.
- Color Coding Kids™ provides pediatric scan protocols based on the Broselow-Luten system™ Pediatric System. This Color-Coding system is incorporated into the protocol selection on the operator's console.
- SmartTrack: The tracking collimator keeps the beam focused only on the active detector cells, and makes sub-millimeter scanning possible with high dose efficiency.
- SmartBeam™: The collimator contains two independently controlled tungsten cams. The rotation of the cams provides continuous variable beam thickness and Z-axis position. The collimator also contains three bowtie beam filters that filter and shape the beam to optimize dose and image performance.

Dose Check

Dose Check provides users with tools to help them manage CT dose in clinical practice and is based on the standard XR-25-2010 published by The Association of Electrical and Medical Imaging Equipment Manufacturers (NEMA).

Dose Check provides the following 11.2

- Checking against the Notification Value if the estimated dose for the scan is above your site established dose value.
- Checking against the Alert Value where the user needs specific authority to continue the scan at the current estimated dose without changing the scan parameters if the estimated dose exceeds the alert value.
- Alert Values for Adult and Pediatric with age threshold
- Audit logging and review capability
- Protocol Change Control capability

Dose Reporting

- Dose Reporting: $CTDI_{vol}$, DLP, Dose Efficiency displays during scan prescription and provides dose information. The $CTDI_{vol}$, DLP and Phantom size used to calculate dose is automatically saved once the user selects End Exam.
- DICOM Structured Dose Report generates a CT Dose Report, which can enable tracking of dose ($CTDI_{vol}$, and DLP) for the patient by the hospital radiation tracking system/RIS/HIS.

2.1.1 Scan mode – Helical

Helical scan mode is a continuous 360 degrees scanning with table incrementation and no inter scan delay.

Multiple-Thickness Reconstruction

40 mm Aperture / 20 mm Aperture

Slice Thickness	0.516:1/ 0.531:1	0.984:1/ 0.969:1	1.375:1/ 1.375:1	1.531:1/ 1.531:1
0.625 mm 1.25 mm 2.5 mm 3.75 mm 5 mm 7.5 mm 10 mm	20/10 mm/rot	39/19 mm/rot	55/27 mm/rot	61/30 mm/rot

For 64ch based system, generating images at 0.1 mm intervals, enables reconstructed images that exceed 128 slices (images) per gantry rotation. The number of slices able to be generated per gantry rotation is a function of rotations and coverage.

Rotations	Z-coverage (mm)	Generated slices (Images/rotation*)
1.71	30	176
2.00	46	230
3.00	101	337
4.00	156	390
5.00	211	422
6.00	266	443
64 slice x 0.625 mm & 1.375:1 helical pitch		

For 32ch based system, generating images at 0.1 mm intervals, enables reconstructed images that exceed 64 slices (images) per gantry rotation. The number of slices able to be generated per gantry rotation is a function of rotations and coverage.

Rotations	Z-coverage (mm)	Generated slices (Images/rotation*)
1.71	30	140
2.00	46	184
3.00	101	269
4.00	156	312
5.00	211	337
6.00	266	354
32 slice x 1.25 mm & 1.375:1 helical pitch		

Helical Scan Parameters

2.6

- Helical Scan Speed: 360° rotational scans: 0.35*, 0.4*, 0.5*, 0.6*, 0.7, 0.8, 0.9, and 1.0
- Cardiac Scan Speeds*: 0.35, 0.375, 0.40, 0.425, 0.45, 0.475, and 0.50.
- Helical Pitch (nominal): 0.516 to 1.531
- Cardiac Pitch: 0.16 to 0.325
- Selectable kV: 80, 100, 120, 140
- 10 to 460 mA at 120 kV, 5 mA increment
- Single Acquisition: 120 second scan maximum
- Minimum Inter-Group Delay (IGD): 1 second between adjacent helical scans

Maximum Display Fields of View:

- 32 cm for pediatric head
- 32 cm for pediatric body
- 32 cm for head
- 32 cm for body - small
- 50 cm for body - large
- 32 cm for cardiac - small
- 50 cm for cardiac - large

Helical Image Reconstruction

1.

- Reconstruction Algorithms: Soft Tissue, Standard, Detail, Chest, Bone, Bone Plus, Lung, Ultra, Edge, Edge Plus, Soft# and Standard#.
- Reconstruction Matrix: 512 x 512, 1024 x 1024
- Display Matrix: 1024 x 1024
- CT Number Scale: ±31,743 HU
- Minimum DFOV: 5.0 cm
- Minimum Pixel Size: 0.10 mm

Helical Scan Protocols

Single helical scans under 120 kV scans (Maximum mA subject to system configuration)

Scan times (s)	Maximum mA
30	385
40	350
50	325
60	310

Scan mode – Helical *(cont.)*

Helical Scan Protocols *(cont.)*

Multiple Helical Scans (IGD = 5 seconds) under 120 kV scans (Maximum mA subject to system configuration)

Max mA			
No scans	10 s scan time	20 s scan time	30 s scan time
2	460	360	315
3	425	335	285
4	405	315	240

2.1.2 Scan mode – Axial and Cine

Axial scan mode: axial slices acquired simultaneously with each 360-degree rotation, with the time between scans set by the user-selected interscan delay (ISD) or intergroup delay (IGD).

Cine scan mode: contiguous axial slices acquired simultaneously with each 360-degree rotation. Half-scan imaging and segmented reconstruction is supported with acquisitions times of 0.65 times that of the scan speed.

Multiple-Thickness Reconstruction

64ch based system

Collimation	Slice thickness	Recon Slice thickness
40 mm / 64 x 0.625 mm	0.625	128i – 0.625 mm◊ 64i – 0.625 mm† 32i – 1.25 mm† 16i – 2.5 mm 8i – 5 mm 4i – 10 mm
20 mm / 32x 0.625 mm	0.625	32i – 0.625 mm 16i – 1.25 mm 8i – 2.5 mm 4i – 5 mm 2i – 10 mm
10 mm / 16 x 0.625 mm	0.625	16i – 0.625 mm 8i – 1.25 mm 4i – 2.5 mm 2i – 5 mm 1i – 10 mm
5 mm / 8 x 0.625 mm	0.625	4i – 1.25 mm 2i – 2.5 mm 1i – 5 mm
2.5 mm / 4 x 0.625 mm	0.625	2i – 1.25 mm 1i – 2.5 mm
1.25 mm / 2 x 0.625 mm	0.625	1i – 1.25 mm

† Retro Recon Only, ◊ Overlapped Reconstruction

Scan mode – Axial and Cine *(cont.)*

Multiple-Thickness Reconstruction *(cont.)*

32ch based system

Collimation	Slice thickness	Recon Slice thickness
40 mm / 32 x 1.25 mm	1.25	32i – 1.25 mm† 16i – 2.5 mm 8i – 5 mm 4i – 10 mm
20 mm / 32x 0.625 mm	0.625	64i – 0.625 mm†◊ 32i – 0.625 mm 16i – 1.25 mm 8i – 2.5 mm 4i – 5 mm 2i – 10 mm
10 mm / 16 x 0.625 mm	0.625	16i – 0.625 mm 8i – 1.25 mm 4i – 2.5 mm 2i – 5 mm 1i – 10 mm
5 mm / 8 x 0.625 mm	0.625	4i – 1.25 mm 2i – 2.5 mm 1i – 5 mm
2.5 mm / 4 x 0.625 mm	0.625	2i – 1.25 mm 1i – 2.5 mm
1.25 mm / 2 x 0.625 mm	0.625	1i – 1.25 mm

† Retro Recon Only, ◊ Overlapped Reconstruction

Axial and Cine Scan Parameters

- Axial: Scan Speeds: 0.35*, 0.4*, 0.5*, 0.6*, 0.7, 0.8, 0.9, 1.0, and 2.0 second full scans (360° acquisition).
- Cine: Scan Speeds: 0.35*, 0.4*, 0.5*, 0.6*, 0.7, 0.8, 0.9 and 1.0 second full scans (360° acquisition).
- Cardiac Scan Speeds*: 0.35
- Selectable kV: 80, 100, 120, 140
- 10 to 460 mA at 120 kV, 5 mA increment
- Single Acquisition at Cine: 120 second scan maximum
- IGD between scans is from 1 sec to 600 sec

Scan mode – Axial and Cine *(cont.)*

Axial and Cine Scan Parameters *(cont.)*

Inter-scan Delay (ISD)

Table Movements	Minimum ISD
0 to 10 mm	1.0 s
10 mm to 20 mm	1.3 s
20 mm to 30 mm	1.6 s
30 mm to 40 mm	1.7 s

Maximum Display Fields of View:

- 32 cm for pediatric head
- 32 cm for pediatric body
- 32 cm for head
- 32 cm for body - small
- 50 cm for body - large
- 32 cm for cardiac - small
- 50 cm for cardiac - large

Axial and Cine Image Reconstruction

- Reconstruction Algorithms: Standard, Soft Tissue, Detail, Chest, Bone, Bone Plus, Lung, Ultra, Edge, Edge Plus, Soft# and Standard#.
- Reconstruction Matrix: 512 x 512, 1024 x 1024
- Display Matrix: 1024 x 1024
- CT Number Scale: ±31,743 HU
- Minimum DFOV: 5.0 cm
- Minimum Pixel Size: 0.1875 mm

Axial and Cine Scan Protocols

55 kW based system under 120 kV scans

Scan time(s)	ISD(s)	mA	Number of scans
1	1	440	45
1	1	360	68
1	1	320	86
1	1	280	110
1	1	240	135

Scan mode – Scout 2.1.3

Scout imaging is used for anatomical location in conjunction with scan and recon prescription, to provide an anatomical cross-reference for axial images, and to provide quick feedback to the user as to the anatomy scanned. Revolution Maxima supports real time scout.

Scout Scan Parameters

- Aperture: 8 x 0.625 mm effective aperture
- Table speed: 100 mm/s or 175 mm/s
- Maximum Display FOV: 50 cm
- Selectable KV: 80, 100, 120, 140
- 10 to 460 mA at 120 kV, 5 mA increment
- Orientation: AP, RLAT, PA, LLAT (preset); or angle from 0° - 359° (manually selected).

Image performance specifications[11]

Helical Scan Image Quality

- High resolution: 0.28 mm

3D MTF

Typical MTF is demonstrated on a 0.05 mm tungsten wire and a 1.0 mm x 0.025 mm gold foil phantom for in-plane and z-plane, respectively.

High resolution algorithm

	X/Y lp/cm	Z lp/cm
50%	12.1	7.3
10%	16.0	12.2
4%	18.3	14.2
0%	>18.3	19.7

Low-Contrast Detectability

On 8-inch (20 cm) Catphan® phantom:

Reconstruction Mode	Object Size	% Contrast	Dose Level (mGy $CTDI_{vol}$) 10 mm slice
ASiR-V* with Standard Algorithm	5 mm	0.30%	4.87
ASiR with Standard Algorithm	5 mm	0.32%	5.69

Image performance specifications *(cont.)*

Helical Scan Image Quality *(cont.)*

Noise

On either an AAPM water phantom or GE HealthCare Quality Assurance phantom with 5 mm slice thickness equivalent:

- 0.43% at 4.70 mGy $CTDI_{vol}$ with ASiR-V Reconstruction Algorithm
- 0.43% at 11.1 mGy $CTDI_{vol}$ with ASiR Reconstruction Algorithm

CTDI

On CTDI Head and Body Dose Reference Phantoms

$CTDI_{vol}$ expressed in mGy/100 mAs (0.984:1 Pitch)

- Head: 17.0 mGy/100 mAs
- Body: 8.8 mGy/100 mAs

Axial Scan Image Quality

High Contrast Spatial Resolution

Typical in-plane MTF is demonstrated on a 0.05 mm tungsten wire.

High resolution algorithm

	X/Y lp/cm
50%	12.1 T2
10%	16.0
2.3 4%	18.3
0%	>18.3

Low-Contrast Detectability

On 8-inch (20 cm) Catphan® phantom:

Reconstruction Mode	Object Size	% Contrast	Dose Level (mGy $CTDI_{vol}$) 10 mm slice
ASiR-V* with Standard Algorithm	5 mm	0.30%	4.57
ASiR with Standard Algorithm	5 mm	0.32%	6.09

Noise

On either an AAPM water phantom or GE HealthCare Quality Assurance phantom with 5 mm slice thickness equivalent:

- 0.43% at 4.95 mGy $CTDI_{vol}$ with ASiR-V Reconstruction Algorithm
- 0.43% at 11.0 mGy $CTDI_{vol}$ with ASiR Reconstruction Algorithm

CTDI

On CTDI Head and Body Dose Reference Phantoms:

CTDIw expressed in mGy/100 mAs:

- Head: 16.7 mGy/100 mAs
- Body: 8.7 Gy/100 mAs

Desktop – Exam RX

4.1 The Exam Rx desktop environment provides the clinical tools necessary for comfortable, efficient control of patient studies. These tools include patient scheduling and data entry, exam protocol selection, protocol viewing and editing, scan data acquisition, image reconstruction, image display and routine analysis, AutoFilm or manual filming, AutoStore and AutoTransfer.

Patient Scheduling

Patient Schedule allows users to preprogram patient information and exam protocols prior to the patient's arrival. At scan time, select from the created list, enter the patient ID number, enter the Accession number, or use the optional Bar Code Reader to call up patient information. Patient information can be easily added or deleted from this list.

Patient Data Entry

Patient data can be entered as part of New Patient set-up or can be recalled from the list of pre-scheduled patients. Common inputs for new patients include: physician, radiologist, technologist and contrast type (oral and IV).

Exam Protocol Selection

Two Anatomical Programmers - one for adults and one for pediatrics - provide quick and easy access to 6840 user-programmable protocols (total). Each programmer has ten anatomical regions with 90 protocols for each region

Protocol View/Edit

When used in conjunction with the Show Localizer, changes made in the View/Edit table that affect the number of scans, image interval, starting/ending locations, tilt, or display FOV are automatically shown on the Show Localizer.

Imaging Protocol Manager*

GE HealthCare's Imaging Protocol Manager is a cloud-based multimodality, protocol-management solution that provides access, insight, and governance for protocols on imaging devices to help providers effortlessly deliver the right exam for each patient and meet regulatory and accreditation requirements in an efficient manner.

See Imaging Protocol Manager datasheet for more functionalities.

Auto Image Management

The Exam Rx work environment conveniently provides for selection of AutoFilm, and AutoTransfer (across a network).

Manual Image Filming

On-screen filming is available for digital camera using a DICOM protocol.

Desktop – ImageWorks

ImageWorks software is designed to take advantage of the Revolution Maxima computer and image processor. This desktop environment includes image management and networking.

Image Analysis software

Revolution Maxima support following Image analysis tools on console.

- Volume Viewer*
- Auto Bone Xpress*
- Vessel IQ Xpress*
- 5. CT Perfusion 4D Neuro*
- CardIQ Xpress 2.0*
- SmartScore*

Image Display

- Viewer
- Mini Viewer

Image Management

Local Database

The Source menu controls the contents of the Patient List and displays the host databases to which the user is currently connected.

CD/DVD/USB

Allows storage of DICOM images and a DICOM Viewer to a CD-R or DVD-R or USB media.

Data Export

Allows storage of images on a CD-R or FTP or USB images as JPEG, PNG, AVI, MPEG, or MOV formats.

Filming

On-screen filming is available for digital camera using a DICOM protocol.

Image Networking

Exams can be selected and moved between the Revolution Maxima and the imaging system supporting the DICOM protocol for network send, receive and pull/query.

Gantry specification

Gantry

Silent design of Revolution Maxima gantry allows significant reduction of audible noise compared with previous GE HealthCare technology.

2.8

Aperture	70 cm
Focus to Detector	95 cm T1
Focus to Iso-center	54 cm
Maximum SFOV	50 cm
Tilt	+/- 30 degree (Digital)

Performix™ 40 Plus X-ray Tube

2.5

Dual Focal Spots

3.3

Focal Spot	IEC 60336: 1993	IEC 60336: 2005
Small	0.7x0.6	0.9x0.7
Large	0.9x0.9	1.2x1.1

Maximum mA for each kV selection:

kV	Small Spot: Max mA	Large Spot: Max mA
80	300	400
100	240	480
120	200	460
140	170	395

Thermal Ratings: 3.1

- Maximum Anode Heat Content (Reference: IEC 60613)
- Maximum X-ray Tube Assembly heat content: 7.7MJ (10.8 MHU)
- Equivalent anode heat capacity with ASiR-V: 39 MHU+
- The maximum anode heat capacity: 5.0 MJ (7.0 MHU)
- Anode heat dissipation: 1070 KHU/min (13.2 kW)

+ Tube equivalence is based on the image noise ratio value between ASiR-V and FBP. The ratio calculation between image noise and dose corresponding mAs is defined as $[(SD_{FBP})^2/(SD_{ASiR\text{-}V})^2 \times \text{tube rating}]$

High Voltage Generation

- kV: 80, 100, 120, 140 3.2 T5
- Power (Hardware): 72 kW 2.12
- Equivalent power with ASiR-V: 310 kW++
- mA range at 120 kV: 10 to 460 mA, 5 mA increment

++ kW equivalence is based on the image noise ratio value between ASiR-V and FBP. The ratio calculation between image noise and dose corresponding mAs is defined as $[(SD_{FBP})^2/(SD_{ASiR\text{-}V})^2 \times \text{generator rating}]$

Clarity Detector

64ch based system

- 54,272 individual elements composed by 64 rows of 0.625 mm thickness at isocenter. All data is acquired as thin slice at 0.625 mm with the option of thicker slice from image reconstruction or processing.
- 98% absorption efficiency.
- 443 reconstructed slices (images) per rotation: under 64ch x 0.625 mm, 1.375 helical pitch, 6 rotation, 266 mm coverage, 0.1 mm recon interval condition

32ch based system

- 54,272 individual elements composed by 64 rows of 0.625 mm thickness at isocenter. All data is acquired as thin slice at 1.25 mm with the option of thicker slice from image reconstruction or processing.
- 32 x 0.625 mm or 32 x 1.25 mm scan mode.
- 98% absorption efficiency.
- 354 reconstructed slices (images) per rotation: under 32ch x 1.25 mm, 1.375 helical pitch, 6 rotation, 266 mm coverage, 0.1 mm recon interval condition

Clarity Data Acquisition System

- 2,460 Hz maximum sample rate.
- 861 - 1968 views per rotation.

Scan control unit

3 TB Disk (system, image, scan disks) stores up to 1,500,000 512 x 2 images and 3520 scan rotations at 64 slice mode or up to 1,500 scan data files, or up to 300 exams.

- Reconstruction speed with Standard reconstruction: Up to 70 frames per second.
- Reconstruction speed with ASiR-V reconstruction: Up to 45 frames per second.

Host computer	Specifications
CPU	Intel Xeon w7-3445 CPU 2.6G Hz 20c/40t
O/S	64-bit
Cache	52.5 MB Intel Smart Cache or equivalent
RAM	96 GB or equivalent
Graphics card	NVIDIA T1000E Graphics
Reconstruction unit	Commercial-Off-The-Shelf Graphics Processor add-in card

Patient table

Three configurations with up to 500 lb (227 kg) or 450 lb (205 kg) patient weight capacity, and up to 2000 mm scannable range (1700 mm or 1610 mm), for longer runoff studies, flexible patient positioning, and easy room siting.

VT2000 Table	
Vertical Range*	430 mm to 991 mm
Vertical Scannable Range*	791 mm to 991 mm
Elevation Speed Full range motion	Less than 22 sec (Fast) Less than 45 sec (Slow)
Elevation Accuracy Position repeatability	±1.5 mm
Horizontal Range	2045 mm
2.10 Horizontal Scannable Range (Axial)**	2000 mm
Horizontal Scannable Range (Helical)**	1890 mm
Horizontal Scannable Range (Scout)**	1900 mm
Cradle Speed Max Horizontal Speeds	175(150***) mm/sec
Cradle Speed. Operator-controlled slow speed operation	5 or 10 mm/sec ±3%
Cradle Speed. Operator-controlled fast speed operation	125 or 175 mm/sec ±2%
Position repeatability	±0.25 mm
Longitudinal accumulated position error	±0.25 mm±0.06%
2.9 Table Load Capability	227 kg (500 lbs)

* The distance from the Table bottom to the cradle upper side surface

** Accuracy is +/- 1%. Table Height and scanning software determine the scannable range.

*** During Move to scan operation

VT1700V Table	
Vertical Range*	430 mm to 991 mm
Vertical Scannable Range*	791 mm to 991 mm
Elevation Speed Full range motion	Less than 22 sec (Fast) Less than 45 sec (Slow)
Elevation Accuracy Position repeatability	±1.5 mm
Horizontal Range	1745 mm
Horizontal Scannable Range (Axial)**	1730 mm
Horizontal Scannable Range (Helical)**	1580 mm
Horizontal Scannable Range (Scout)**	1600 mm
Cradle Speed Max Horizontal Speeds	175(150***) mm/sec
Cradle Speed. Operator-controlled slow speed operation	5 or 10 mm/sec ±3%
Cradle Speed. Operator-controlled fast speed operation	125 or 175 mm/sec ±2%
Position repeatability	±0.25 mm
Longitudinal accumulated position error	±0.25 mm±0.06%
Table Load Capability	227 kg (500 lbs)

Lite Plus Table	
Vertical Range*	441 mm to 991 mm
Vertical Scannable Range*	791 mm to 991 mm
Elevation Speed Full range motion	30 +/-10 seconds (full range)
Elevation Accuracy Position repeatability	±3.0 mm
Horizontal Range	1620 mm
Horizontal Scannable Range (Axial)**	1610 mm
Horizontal Scannable Range (Helical)**	1460 mm
Horizontal Scannable Range (Scout)**	1450 mm
Cradle Speed Max Horizontal Speeds	100 mm/sec
Cradle Speed. Operator-controlled slow speed operation	5 mm/sec ±3%
Cradle Speed. Operator-controlled fast speed operation	100 mm/sec ±3%
Position repeatability	±0.25 mm
Longitudinal accumulated position error	±0.25 mm±0.1%
Table Load Capability	205 kg (450 lbs)

Peripherals

Scan control keyboard assembly with intercom speaker, microphone and volume controls.

Color LCD monitors (2 standard):

- 19-inch diagonal width
- 1280 x 1024 dot resolution
- Horizontal & Vertical viewing angle: 170 degrees
- Horizontal synchronization range: 31.0 – 80.0 kHz
- Vertical synchronization range: 50 - 75 Hz

DVD-R/CD-R (DICOM Interchange):

- 4.7 GB capacity (DVD)
- Approximately 7000 image storage (DVD)
- Supports CD-R, DVD-R

2-Button + Scroll Wheel Mouse

Image Networking

Image transfer time using DICOM protocols is 10 fps on a 1000baseT network.

DICOM Conformance Standards

For detailed information, a DICOM conformance statement is available upon request.

4.3

- DICOM Storage Service Class
- Service Class User (SCU) for image send
- Service Class Provider (SCP) for image receive
- Service Class User (SCU) for storage commitment
- DICOM Query/Retrieve Service Class
- DICOM Storage Commitment Class Push
- DICOM Modality Worklist
- DICOM Modality Performed Procedure Step
- DICOM Print
- DICOM Structured Dose Report

Filming Protocol

DICOM protocol

Important note: The Revolution Maxima comes standard with a DICOM Print Interface configurable for multiple DICOM Print destinations. Connections with cameras that do not support DICOM Print may require a filming interface (purchased separately).

Anti-Virus software

Standard McAFee Anti-Virus software

Energy saving

GE HealthCare's High Efficiency CT systems are designed to reduce electricity consumption for operation and ambient cooling by optimizing energy use based on a customer's usage profile. The Revolution Maxima system and its associated site cooling systems consume approximately 48,200 kWh of electricity per year, about 29% less than the previous-generation GE HealthCare system it replaces. For customers actively pursuing energy efficiency strategies, use of the innovative Energy Saving Mode software during evenings and weekends when the CT system is not in use can reduce annual electricity consumption by an additional 19,100 kWh, or a total of 58% per system compared to the previous-generation GE HealthCare system.

		Previous-generation GE HealthCare system	Revolution Maxima without ESM	Revolution Maxima with ESM
CT system*	Yearly Energy(kWh)	32722.8	12505.0	10588.4
	Reduction Energy (kWh)	-	20217.8	22134.4
	Reduction Energy (%)	-	62%	68%
Associated site cooling systems	Yearly Energy(kWh)	35708.4	35708.4	18008.7
Total	Yearly Energy(kWh)	68431.2	48213.4	28597.1
	Reduction Energy (kWh)	-	20217.8	39834.1
	Reduction Energy (%)	-	29.5%	58.2%

* Value of CT system was measured based on COCIR (European Coordination Committee of the Radiological) procedure.

GE HealthCare

Date: **January 20, 2025**

MANUFACTURER STATEMENT

To whom it may concern,

We, GE Medical Systems Société en Commandite Simple, a company duly existing under the laws of France and having a registered seat at 283 Rue de la Minière, 78530 Buc, France, with commercial name GE HealthCare, in its capacity as European MDR Authorized Representative of **GE HANGWEI MEDICAL SYSTEMS CO., LTD.,** West Area of Building No.3, No.1 Yongchang North Road, Beijing Economic and Technological Development Area, BEIJING 100176 CHINA, established and reputable manufacturer of CT scanner Revolution Maxima, do hereby confirm the fulfillment of the following specifications:

Revolution Maxima computed tomography system offers following functionality:

- automation of the examination process using a 3D camera based on artificial intelligence algorithms, including automatic patient positioning and centering, automatic scanning zone determination, 7.
- maximum helical scanning speed at a field of view (FOV) of 50 cm is 175 mm/s. 2.7 T3

On behalf and for GE Medical Systems SCS

Jennifer Thery

GE MEDICAL SYSTEMS
Société en Commandite Simple
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RCS Versailles B 315 013 359
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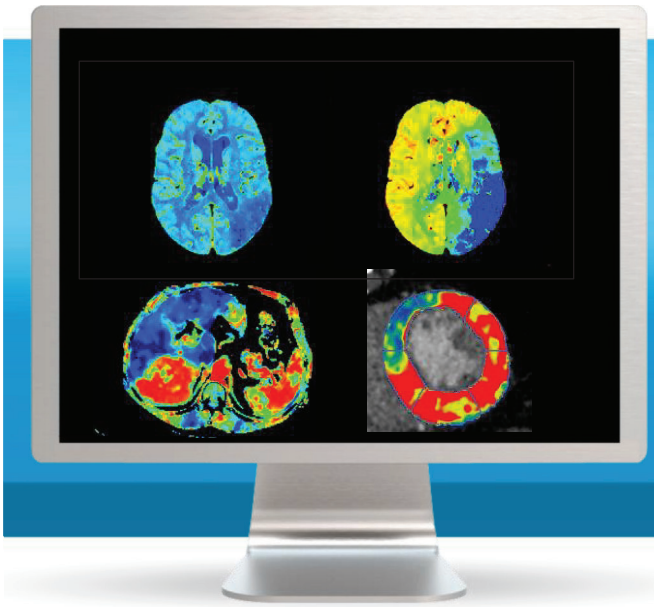
GE Medical Systems SCS
Jennifer Thery - EMEA Contract Specialist
Authorized Signatory

Date of signature: January 20, 2025

GE Healthcare



CT Perfusion 4D

Comprehensive perfusion analysis available for neurology, oncology and cardiology.
Easy-to-use, protocol-driven workflow for all organs.

8.4.2

Perfusion 4D has been expanded beyond stroke and oncology to now include dynamic myocardial perfusion. For any organ where blood perfusion is of interest Perfusion 4D is a complete package to quantitatively provide the necessary information to guide treatment decisions.

The protocol-driven design leads the user step-by-step through the process, reducing keystrokes and improving repeatability. Get the information you want quickly and reliably.

What's new

- Dynamic myocardial perfusion maps
- Improved IQ of functional maps in presence of noise.
- Improved processing times
- Improved ROI mirroring for brain protocols
- Streamlined workflow for tissue classification.
- Permits injection rates of 4cc/sec.
- Incorporates the GE delay-corrected deconvolution method.
- Dynamic registration

Overview 8.4.2

GE's Perfusion 4D is a fast, easy-to-use automated software for analyzing CT Perfusion images related to stroke, tumor angiogenesis and dynamic myocardial perfusion. Its simple user interface and automated perfusion post-processing make it easy for you to diagnose quickly and accurately – and make treatment decisions more confidently.

GE leverages its deconvolution expertise, with its innovative delay correction algorithm. Perfusion 4D takes perfusion assessment to the next level, with the addition of CT Dynamic Myocardial Perfusion. Providing the classic color overlays with quantitative measurements to evaluate myocardial blood perfusion.

Visit us:
http://www3.gehealthcare.com/en/products/categories/advanced_visualization/applications/ct_perfusion_4d_multi-organs

Features

- Visualize all information in true volumetric form with the ability to employ all the volumetric-based image analysis tools in the AW Volume Viewer.
- Whole heart perfusion with semi-automatic guided workflow to aid in assessment of myocardial ischemia
- Smart Maps using the intelligent 4D noise suppression algorithm improves functional map image quality in the presence of noise.
- Streamlined tissue classification and visualization incorporates thresholding of selected functional maps.
- Dynamic non-rigid registration protocols for dynamic acquisitions within the body.
- Productivity enhancements include:
  - Ability to select automated vessel detection or manual vessel detection for Brain Perfusion
  - Faster processing times for functional map computations
  - Volumetric visualization of functional maps
  - Access from anywhere using AW Server.
  - Time stamps on functional maps and Regions of interest (ROIs).
  - Interactive large vessels exclusion.
- Many basic features, including the ability to:
  - Process double phase acquisition data.
  - Create 4D Regions of interest (ROIs).

5.

  - Display Regions of interest (ROI) statistical information.
  - Display averaged time intensity information of the Regions of interest (ROI).
  - Simultaneously review any number of functional maps.
  - Customize protocols
  - Save parameters.
- Includes these CT post-processing protocols:
  - Brain stroke
  - Brain tumor
  - Dynamic Myocardial Perfusion
  - Body tumor
  - Liver perfusion
  - Pancreas perfusion
  - Prostate perfusion
  - Kidney perfusion
  - Soft tissue perfusion
  - Spleen perfusion
  - Bone perfusion
  - Liver Dynamic Registration
  - Cardiac Dynamic Registration

8.4.2

- Functional maps:

5.

  - Regional cerebral blood volume
  - Regional cerebral blood flow
  - Regional mean transit time
  - Contrast arrival delay
  - Transit time to peak of impulse residue function
  - Capillary permeability surface area for lengthened acquisition protocols
  - Mean Slope of Increase
  - Base image
  - Average image

System Requirements

Advantage Workstation Volume Share 4.7 or higher, AW Server 3.2 or higher, Centricity™ Universal Viewer

- Z820, Z440 (and later) with 24GB or higher of RAM for the AW
- Recommended monitor resolution is up to dual 2MP (1600 x 1200) or a single 3MP (1536 x 2048) for the AWS

Intended Use

CT Perfusion 4D is an image analysis software package that allows the user to produce dynamic image data and to generate information with regard to changes in image intensity over time. It supports the analysis of CT Perfusion images, obtained by cine imaging (in the head and body) after the intravenous injection of contrast, in calculation of the various perfusion-related parameters (i.e. regional blood flow, regional blood volume, mean transit time and capillary permeability).
The results are displayed in a user-friendly graphic format as parametric images. This software will aid in the assessment of the extent and type of perfusion, blood volume and capillary permeability changes, which may be related to stroke or tumor angiogenesis and the treatment thereof.

Regulatory Compliance

This product complies with the European Council Directive 93/42/EEC Medical Device Directive as amended by European Council Directive 2007/47/EC.

GE imagination at work

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DOC1996217.

GE Healthcare

8.

AW Server 3.2

Powering advanced applications across the healthcare enterprise

Continuous improvement in image acquisition capabilities are rapidly expanding your everyday clinical practice and providing new ways to improve patient care. As a result, a solution for manipulating and distributing access to volumetric images becomes as important as the acquisition modalities themselves.

AW Server is your platform supporting a broad portfolio of efficient and automated workflows that allow you to manage your time, equipment resources and costs while enhancing your team's ability to collaborate and provide diagnoses. The AW Server adds speed, efficiency, and diagnostic flexibility to your workflow. Its applications portfolio helps boost your diagnostic confidence as you analyze and evaluate exams from angiography to X-ray and almost everything in between. With its novel, easy to use, intuitive interfaces and reporting flexibility, the AW Server streamlines your workflow and helps make your entire department more productive.

Overview

AW Server 3.2 introduces an extensive portfolio of advanced applications that is virtualization-ready. With a local cache receiving DICOM images from your modalities and priors from your PACS, this streamlined advanced visualization workflow engine enables rapid preparation and communication of 3D results throughout the enterprise with access to innovative AW applications.

What's new

- Designed with VolumeShare 7, a multi-modality advanced visualization workflow solution that helps to enhance diagnostic confidence and productivity.
- Simplified user experience with powerful support for advanced applications workflows.
- Virtualization-ready platform provides enterprise-wide access to advanced processing applications.
- Support for dual monitors expands screen space to hang more views.
- New hardware supports expanded number of slices - up to 160,000.
- DICOM Direct Connect adds standards-based study retrieval from DICOM storage to expand and improve integration with your enterprise workflow

Visit us:
www.gehealthcare.com/aw/platforms/aw-server/

JVC

6 Megapixel 30" Color Monitor

CL-S600

8.1.1, 8.1.2, 8.1.3

The gold standard in medical imaging

i3 for Medical Imaging SERIES

6MP | 30" | 1300 cd/m² | 2000:1 | Visual Point Mode | Turbo Luminance | Dynamic Range Extension | Dynamic Gamma | Auto Text Mode | Uniformity Equalizer | Auto Config Select | Pixel Enhancer | DisplayPort Daisy Chains | Color Front Sensor | Human Presence Sensor | Reading Light

6 Megapixel 30" Color Monitor

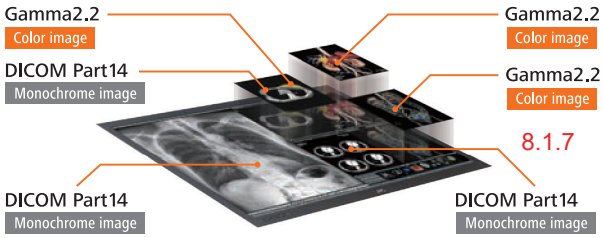
CL-S600

6MP for multi modality diagnosis

Providing optimal functions for diagnostic viewing such as DR, CT, MRI and pathology, CL-S600 with seamless and wide screen improves your workflow efficiency while reducing eye strain and ensuring space and energy saving.

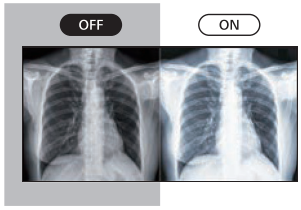
Dynamic gamma

Color images are automatically recognized to provide optimized contrast, brightness and gamma. No user intervention is required.



Improved visibility

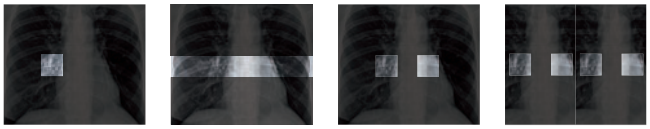
The Turbo Luminance function can boost screen brightness and contrast to maximum for 30 seconds to magnify identifiable grayscale gradations, contributing to finding out low contrast lesions.



Turbo Luminance

Focus on details

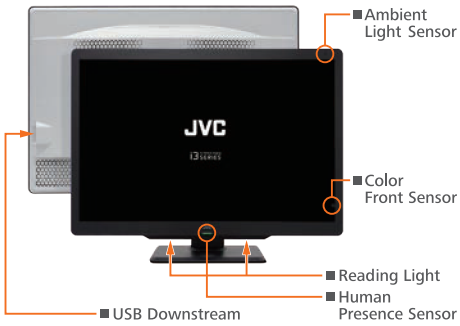
Using Visual Point Mode, you can focus on the detail where you want to see. (4 options of area shape)
It can also be used in combination with the Turbo Luminance function.



Visual Point Mode with 4 options of area shape

Advanced features

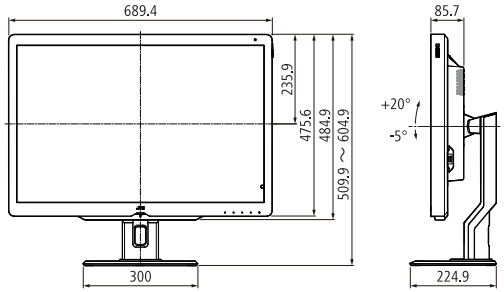
- Reading Light
- LED Indicator / Front Buttons
- Built-in Sensor
- Space Saving
- Wire Management / DisplayPort Daisy Chains
- DICOM Conformance Check



Specifications

Model Name		CL-S600
Model Type		CL-S600BN(AG), CL-S600BA(AR)
LCD Panel	Technology	30" color TFT IPS technology
	Display Area	645.5 mm × 409.34 mm
	Pixel Pitch	0.197 mm × 0.197 mm
	Maximum Luminance	1300 cd/m² (typ.) 8.1.4 600 cd/m² (calibrated)
	Contrast Ratio	2000 : 1 (typ.) 8.1.5
	Viewing Angle	178° vertical and horizontal
Visual Performance	Native Resolution	3280 × 2080
	Display Colors	16.77 million colors 1.07 billion colors with DisplayPort and 10-bit viewer
Interface	Input Signal	DisplayPort (DisplayPort 1.4) × 2
	Output Signal	DisplayPort (DisplayPort 1.4) × 1
	Plug and Play	DDC2B compliant
Input Power Supply	Input Power Supply	100 V - 240 V 50 / 60 Hz
	Power Consumption	80 W (typ.)
Features	Calibration Control	Luminance, Gamma, Color temperature, Capable of storing 5 sets of LUT (Optional Calibration Kit is required)
	OSD Information Display	Model name, Serial No., Total operating time, Calibration settings (Operating time since last calibration, Luminance, Gamma), Current luminance, Color temperature and Ambient light, DICOM conformance
	USB Hub	USB Rev.2 compliant, Self-powered USB upstream connector (×1), USB downstream connector (×3)
	Other Features	Uniformity Equalizer, LED indicator, Reading Light, Advanced power management, Human Presence Sensor, Dynamic Gamma, Visual Point Mode, Turbo Luminance, Auto Text Mode, Luminance stabilization, Multiple LUT, Self DICOM check, Dynamic Range Extension, Auto Config Select, Pixel Enhancer, Self-calibration
Approvals		ANSI/AAMI ES60601-1 (2005) + A1 (2012), CAN/CSA-C22.2 No. 60601-1 (2014), CE (EN60601-1, EN60601-1-2), FCC Part15 subpart B Class B, ICES-003-B, VCCI-B, FDA510(k), J-Moss, RoHS, EAC, RCM
Physical Characteristics	Dimensions (W × H × D)	With stand : 689.4 mm × 509.9 (604.9) mm × 224.9 mm Without stand : 689.4 mm × 475.6 (484.9) mm × 85.7 mm
	Weight	approx. 15.1 kg
	Tilt Stand	Tilt, Swivel
	Mount	VESA standard (100 mm × 100 mm)
Accessories		Power cord, DisplayPort cable, USB cable, Operation manual, Installation manual, Software (QA Medivisor Agent LE)

Dimensions (mm)

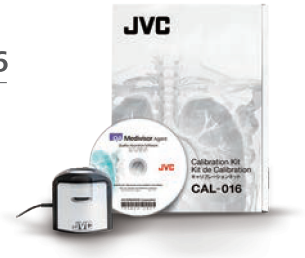


Options

8.1.6

Calibration Kit CAL-016

- QA and calibration software [QA Medivisor Agent]
- Calibration sensor



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Safety Precautions

- Please read the user's manual for safe and proper use.
- Do not expose the product to dust, moisture, steam, or oily smoke. It could cause fire, electric shock, or a failure.

Please contact our distributor below with inquiries and orders.

Healthcare Business Division
JVCKENWOOD Corporation
3-12, Moriya-cho, Kanagawa-ku, Yokohama-shi, Kanagawa, 221-0022, JAPAN
TEL : +81-45-450-1908 FAX : +81-45-450-1926
Email : medical-display.j@jvckenwood.com

▶JVC Healthcare Website
http://healthcare.jvc.com/

8.

Eaton 5E UPS

500/650/850/1100/1500/2000VA

5E Range

5E 1100 USB

Ideal for protecting:

- PC, workstation
- NAS, internet access point, TV
- Point of sales, business telephony

Essential line interactive UPS

Line interactive technology at an affordable price

- UPS is securing your data and your equipment by protecting you against power outages and bad power quality
- Work through under & overvoltage without wasting battery thanks to Automatic Voltage Regulation (AVR)
- Unmatched price/performance ratio

Eaton reliability

- Trust a leading manufacturer with decades of experience and high quality standards : CE compliance certified by external agency (TUV)
- Rely on batteries anytime : 5E batteries are permanently recharged (even when off) and UPS can start without mains (Cold-start)
- Avoid back door damages coming through phone lines : 5E USB models are equipped with data line surge protection (Internet/Tel/Fax)
- Ensure peace of mind with 3 years of UPS and battery warranty

Easy integration

- Plug easily any equipment to the UPS (PC, HD TV, internet gateway, etc. thanks to IEC
- Install 5E anywhere thanks to its small size
- Easily manage your UPS from your PC (on USB models):
  - Automatic integration into Windows/MacOS/Linux power management for safe system shutdown
  - Analyze energy use and costs, manage UPS parameters, with Eaton UPS Companion software

Powering Business Worldwide

GE Healthcare

Volume Viewer

GE Healthcare's premium Advanced Visualization and Image Processing platform brings you powerful 3D capabilities to help you visualize and interpret your multimodality imaging data with confidence and ease.

Today's imaging modalities provide a wealth of diagnostic information, but also present a challenge to your Radiology workflow as image volumes continue to increase while your time for reading and reporting decreases.

Volume Viewer provides you with a rich 3D image processing toolset aimed at creating and displaying the views you need with little user input, and streamlining interpretation and reporting by providing the visualization tools you need with minimum clicks.

Now, a refreshed Volume Viewer application with an intuitive, modern user interface helps a wide diversity of users to learn and master the expanding portfolio of sophisticated tools and applications that Volume Viewer provides. This customizable user interface maximizes the real estate allocated for displaying images, and provides access to the users' favorite tools directly from the image viewport. In addition, a customizable toolbar provides one click access to commonly used tools to facilitate a productive review.

Overview

Volume Viewer provides excellent 3D visualization and processing capabilities for reading and comparing CT, MR, 3D X-ray, PET, PET/MR and PET/CT datasets. Volume Viewer also features a broad portfolio of high-performance analysis tools, automating routine tasks and helping to make 3D image processing a stress-free component of your routine workflow.

Volume Viewer is available on VolumeShare 7, a multi-modality advanced visualization workflow solution that helps to enhance diagnostic precision and productivity.

Highlights

- Refreshed user interface with more viewing space for clinical images.
- Simplified and intuitive tools for annotation and measurement.
- Customizable toolbars allowing your favorite tools to be one click away.
- Compare multiple exams from different modalities, at loading and on the fly. 8.4.1
- 3D reformatting, MIP/MPR. High-resolution volume rendering.
- Easy to use point-and-click tools for segmenting structures of interest.
- Comprehensive, one click or two clicks tracking for any vascular structure (Quick Vessel Trace).
- Interactive Summary Table collecting measurements as they are deposited on the images.
- Adaptive layouts that take advantage of the dual monitor capabilities in landscape and portrait orientations.
- Support of Chinese, Japanese, Korean and Russian languages.[1]

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www.gehealthcare.com/aw/applications/

Workflow enhancements

Pre-processing[4] features on AW Server

- Preprocessing is a Volume Viewer feature that automatically performs routine processing tasks and saves the results so they are ready for you. When new exams are transferred to the database, Volume Viewer recognizes user-defined keywords in the Series Description and launches the appropriate pre-processing. The results are stored in a Save State object with the original study so you can load it when you are ready for review.

AutoLaunch[4] features on AW workstation

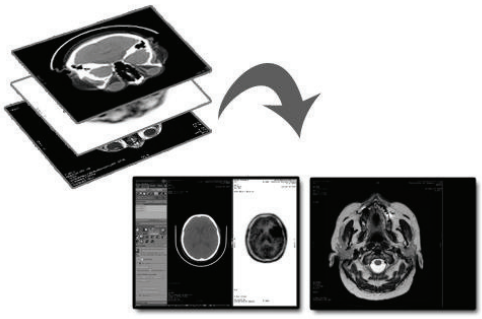
- AutoLaunch is a Volume Viewer feature that automatically launches and preloads exams, so they are ready for your review.
- When you are processing a study and a new exam is transferred to the AW Workstation, this feature automatically launches the new exam with an appropriate Volume Viewer protocol in the background. When you are ready, one click in the AutoLaunch window instantly brings up the exam in the Volume Viewer application, eliminating waiting time and extra steps to load the exam into computer memory for processing.
- AutoLaunch is compatible with CT, MR and PET single volume protocols of Volume Viewer.
- When combined with optional applications[4], this feature gives access to data already preprocessed, that you can review by just clicking on AutoLaunch window.

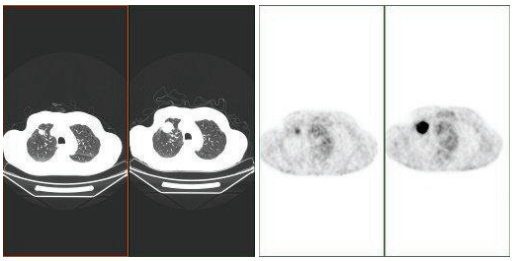
Smart compression

- The Smart Compression technology automatically displays images with full fidelity when the image is still, then uses the selected compression level for increased interaction speed during user manipulations. This allows for diagnostic reads on full fidelity static images with responsive dynamic display even at low bandwidth. On-image visual indicators notify the user when compression is in effect.

Smart layout

- Volume Viewer General Review protocol presents an adaptive layout for single and multi-modality PACS-like reading of data. This protocol distributes and displays all loaded series of a single exam in an intelligent layout to maximize use of available monitor space. With multiple exams, the protocol automatically detects and distributes "like" series for optimal comparison.





3D and 4D capabilities

8.4.1

- Volume Viewer allows 3D point synchronization in any orientation on the fly.
- Real time reformat in oblique planes is available for your exams, as well as simple and double oblique interactive modes.
- To simplify and improve exam screening, Volume Viewer provides an interactive viewport control that lets you perform the following functions: Continuous or contiguous slice paging; slice thickness adjustment and rendering mode (MIP, MinIP, Average, Volume Rendering).
- Quick access to cross reference display gives you the ability to display the current slice location or all slices, on other planes.
- You can review images in 4D mode, by using Cine tool on all planes and 3D views for CT, MR, and PET multiphase data.

Compare mode

- With Volume Viewer you can load several volumes either from the same exam or from different exams. This is useful for exam comparison (Compare Mode) or for Multiphase examinations (of the liver for example). The Compare Mode is also available for PET/CT examinations and takes advantage of a dual screen configuration.
- Multi-phase CT and MR data are listed as separate phases in the Series Selection screen, allowing you to select all phases or a subset of phase data for review. The Series Selection Panel displays the multi-phase data split into arterial and portal phases, for example.
- **Dynamic Load**, compatible with both Volume Viewer and Fusion protocols, lets you drag & drop 3D volumes from CT, MR, PET, and 3D XA modalities into a desired viewport. Together with the Integrated

Registration option[5], Dynamic Load allows new volumes to be registered and loaded on the fly. Save State series can be restored as a separate session. For dual monitor configurations, a Save State series can be displayed on the right monitor together with a current session on the left monitor. For single monitor configurations, a user may simply switch between the two sessions.
- The zoom and pan functions are propagated to all images displayed in the same orientation.

2D/3D ROI tools for quantitative measurements

- Volume Viewer contains a set of basic 2D/3D tools: distance, angle, report cursor, arrow tool, annotation, free hand ROI tool, that can be placed on fused images as well.
- You can easily deposit and label measurements.
- All 3D ROIs can be customized and color coded to display statistics computed on different intensity range.

- All measurements are considered bookmarks and you can navigate through the list by using the markers displayed in the slider of each image.

Summary table

- The Summary Table collects measurements and organizes them according to finding and exam date.

- The Summary Table allows you to automatically navigate through findings in the image viewports and can be docked or expanded.

Export capabilities

Volume Viewer contains multiple standard options for exporting the results of a review session:
- Save images to the database, as new series
- Save the significant images as Key Image Note objects in the database. Key Image Notes and End Review allow you to flag images of interest as Key Image Notes (IHE profile) and push them to the archiving system when you exit the application.
- Save State object helps you to save the work and create a new series containing all the post processing data, for future review. It saves the current status of Volume Viewer (3D Model, displays, measurements, annotations, etc), as an additional series in the same exam.
- Save STL file from 3D model, so that you can use it for 3D printing[1].

The following features are available to create the sequence of the images to be exported:
- The Batch allows creating of a sequence of rotating 3D views, or batch of reformatted images.
- The Movie tool creates a comprehensive movie including different rotations, zooms, and pan of the image, which can be exported as DICOM series or mpeg file.
- Quick Export: Exports in a single click a batch of rotations of a 3D View or a full batch of contiguous images at the displayed thickness for 2D images.
- Cardiac Review and Export: Processing and reviewing cardiac exams for CT, MR and PET with manual oblique reformatted protocols can be exported into a multi-phase Cine movie that allows the referring physician to review the exam in a dynamic mode.
- Capture images on the fly on your computer via standard Ctrl+C /Ctrl+V (on AW Server only).

Advanced visualization capabilities

Volume Viewer offers various capabilities to display advanced rendering modes:
- 3D Volume Rendering images.
- MPR views with different slice thickness. The following rendering modes are available for all Thick Slab: MIP, MinIP, Volume Rendering, Average. 8.4.8
- Navigator views which display interactive endoluminal views exportable as movies.
- Curvilinear reformatting allowing display of curved, lumen and cross section views for various structures (vessels, spine, etc).

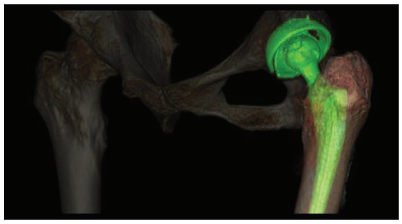
Predefined cut planes

Volume Viewer lets the user define cut planes in order to isolate certain structures in the VR model, in the following 16 configurations:
- Left / Right / Inferior / Superior / Anterior / Posterior / Front
- Left and Right Anterior Superior / Anterior Inferior
- Left and Right Posterior Superior/ Posterior Inferior

You can then display the voxels values on each plane.

Multiple VR objects

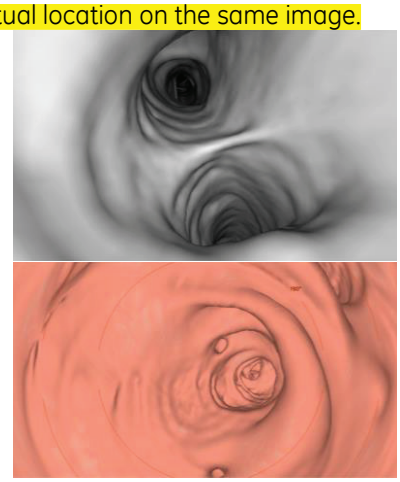
- Volume Viewer allows you to merge up to 8 Volume Rendered models into a single 3D view.
- You can adjust independently the threshold, colors, and transparency of each VR model.



Auto-center fly through with smart cursor

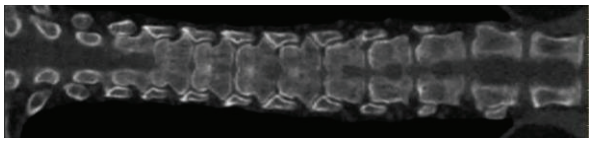
8.4.8

- In fly-through in air or vessel contrast studies (airways, colon, angiography) you can automatically navigate along the centerline of the structure of interest, simply by pressing the forward or the backward key. You can save the fly-through movie with a simple click.
- In addition to the regular 180° or less Navigator view, Volume Viewer enables a Fish-Eye View with any wide camera angle value from 180° to 360°. This provides a view of structures both in front of and behind the users' virtual location on the same image.



Lumen view

- Lumen View provides an unfolded 3D view of a previously outlined structure. The lumen view can be interactively rotated around the centerline of the structure and set the width and field of view.



Advanced 3D tools

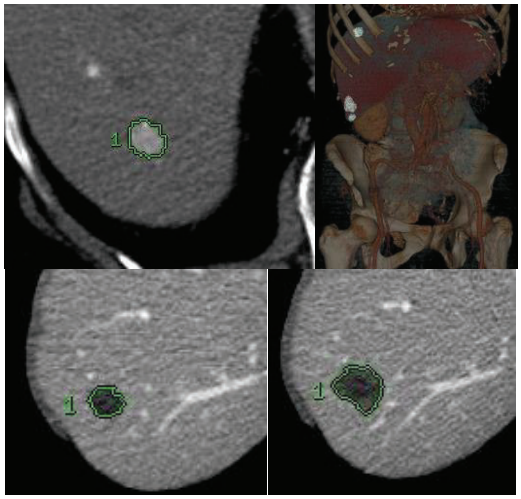
Segmentation tools

- Point and click the AutoSelect segmentation tool to add or remove any continuous structures of interest, including bone and vessel structures for CT and vessel structures for MR. It is also possible to remove the CT couch from images with one click.
- You can also access advanced segmentation tools such as Scalpel, Threshold, Dilate, Erode, Subtraction, Intersection, Addition, Filter Floaters.

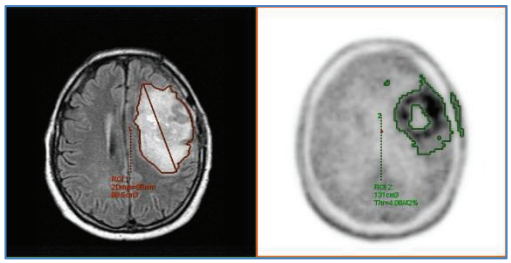
AutoContour tool

- Autocontour gives you consistent tools for multi-modality review and comparison: the same contouring tool with the same workflow supports CT, MR, and PET images.

- For CT and MR images, the contouring tool will suggest contour boundaries of structures and let you edit and validate the result.



- For PET images, the contouring tool has been adapted for standard SUV calculations.

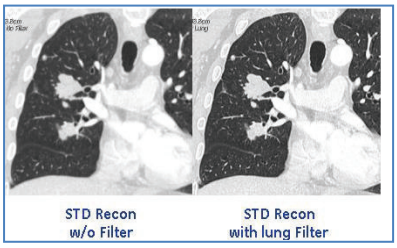


Quick vessel trace (CT and MR images)

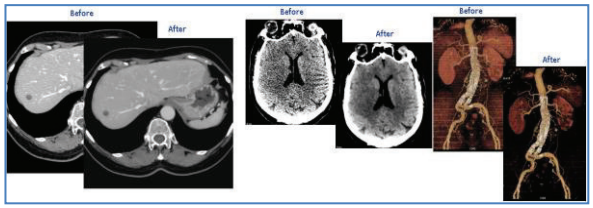
- You can perform vessel analysis with one or two point clicks from any CT or MR Angiography images.
- When you deposit one point, the program automatically extracts the vessel and launches vessel tracking for fast review in curved reformat, cross-sectional, best L-section, lumen, and MRP view.
- You can extend tracking proximally or distally for a full view of the vessel.
- If you detect a lesion, you can quickly analyze it by dropping just one point above and one below the vessel section. The vessel tracking launches automatically.

CT image quality

- Enhancing and smoothing filters are provided to help improve CT image quality for review.
- The lung filter helps enhance contours of images reconstructed in standard mode for excellent visualization of lung structures.



- A smoothing filter reduces noise while maintaining high image contrast:



Dual energy protocols 8.4.7

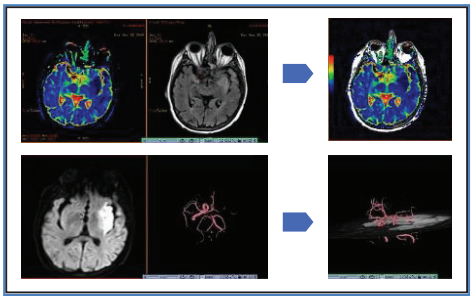
Three protocols are available to enable review of dual energy images acquired on compatible GE Healthcare scanners:

- **DE Calcium** enhances pixels with ratio (HU_{80}/HU_{140}) ≥ 1.25
- **DE Uric Acid** enhances pixels with ratio (HU_{80}/HU_{140}) ≤ 1.25
- **DE Custom** enhances pixels with customized ratio (HU_{Low}/HU_{High})

Review of MR studies

Volume Viewer offers support for review of MR studies, through dedicated protocols that can be selected as My Protocol.

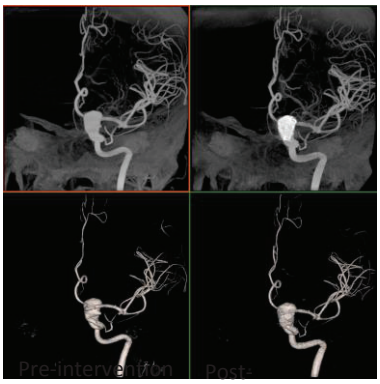
- The MR-specific parameters (PSD name, image weighting, scan plane, etc) are recognized at loading and are used to automatically organize the display by sequence in a specific viewport in the layout.
- Anatomy-based protocols for standardized review (e.g. spine, brain stroke...) thanks to guided layouts with display intelligence to help analyze MR data
- Dedicated MR Cardiac Viewer for single and multiple Cine Review. Enables comparison between cardiac series such as Time Course and Myocardial Delayed Enhancement (MDE) images.
- Supports MR Multi Echo, Multiphase, Diffusion series.
- Supports review of parametric series (e.g., ADC, MTT, and other parametric maps) created in READY View or Functool[6] and enables direct measurement on functional maps.



- 2D and 3D ROI propagation to other phases / series / exams allowing you to easily correlate information from multiple sources.
- Improved MR annotation consistency.
- In combination with Integrated Registration[3], enables direct access to MR image registration (inter/intra exam), image fusion and Whole Body MR Review protocols
- Ability to automatically bind several MR axial series corresponding to sequential axial locations into a single series. This may be displayed as sagittal or coronal reformats. This is useful for consolidating multi-stage acquisitions for displaying Whole Body MR scanning.

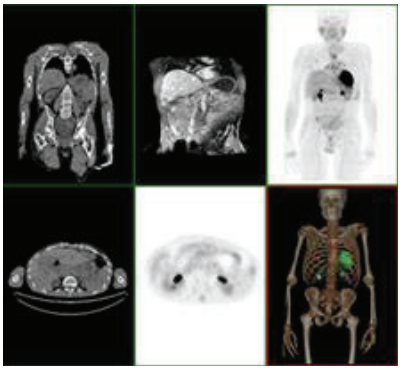
SUV measurements on PET images

- Volume Viewer supports Standardized Uptake Values (SUV) for image display and measurement. Several SUV scales are available by right-clicking the unit on–view annotation: SUVbw, SUV lbm, SUVbsa, as well as SUV Peak.
- Window/level presets may be user-defined in SUV.
- When DICOM information necessary for SUV calculation (eg height, weight) is missing from the original images, you can enter it and compute SUV values on the fly.
- The SUV values are available in all the basic 2D/3D ROI tools of Volume Viewer and in the thresholded VOI tool.



PET/CT and PET/MR dedicated protocols

- Volume Viewer contains a list of predefined protocols allowing the review of PET/CT and PET/MR data. The screen layouts contain fused views between the morphological and functional image, 3DMIP rendering of PET images.
- PET 4D protocol allows users to load and display gated and dynamic PET series.
- Factory protocols are customizable for your own review.
- Summing/Reframing tool allows you to Reframe/Rebin series for Dynamic and Gated PET data[1].



Dedicated features for 3D XA images

The optional Innova 3D XR application produces XA images (512x512 images or 256x256 images depending on your settings). This format opens the Volume Viewer world to Innova 3D images:

- Single exam: Innova Navigator, Curved Reformat, Multi Oblique, MPVR 3mm Average, Segment Structure
- Compare exam: Compare Axial, Compare Coronal, Compare Sagittal, Reformat
- Create your layouts and protocols
- The Innova options provide access to Workflow booster tools, easy multi-modality review "on-the-fly" dedicated Innova review protocols with dedicated Review Steps.

Summary of Operation

- Volumetric models are loaded by selecting the exam or series. The user can select a protocol category from an anatomical selector or go directly to a Review Layout. In either case, images are loaded progressively in the background; this gives control to the user in just a few seconds after selecting the images. Selecting a Review Layout launches a volumetric display protocol with predefined layout preferences. Review Layouts may be saved and combined to suit the user's workflow. Selecting a protocol category unlocks a variety of visual protocols that include the layout, threshold, rendering mode and filming formats. Some of these protocols direct the user through the process providing capabilities to interactively view and manipulate the model, increasing productivity and consistency for all modalities.

References

[4] Preprocessing/AutoLaunch is compatible with the following purchasable options: AutoBone™ Xpress, CardIQ Xpress Reveal, CardIQ Xpress Function, Advanced CTC Pro 3D EC, Colon VCAR, CT Perfusion 4D. ColonVCAR is not for sale in the US.

[5] Integrated Registration is a GE Healthcare product, sold separately.

[6] READY View and Functool are GE Healthcare products, sold separately.

GE Healthcare

VesselIQ™ Xpress with AutoBone™

Fast and Easy to Use Vessel Analysis with Automated Real-Time Tracking, Auto-Labeling and Simplified User Interface.

Peripheral vascular disease (PVD) is a condition similar to coronary artery disease and carotid artery disease. In PVD, fatty deposits build up in the inner linings of the artery walls. These blockages restrict blood circulation, mainly in arteries leading to the kidneys, stomach, arms, legs and feet.

There are different clinical techniques used to diagnose PVD. Computed Tomography Angiography (CTA) can potentially provide sufficient information for therapeutic decision-making and reduced imaging costs for the management of PVD. One of the advantages of computed tomography (CT) is that it shows both vascular & nonvascular anatomy and also provides 3D information for best view. Also, CT may be more useful for patients with limited or no peripheral access or with stents, who may not be candidates for magnetic resonance angiography (MRA). Complementary to the ability to perform CTA is to perform clinical assessment by a dedicated post-processing tool.

8.4.3

Overview

VesselIQ™ Xpress with Autobone is a post-processing software package for the Advantage Workstation (AW) platform, AW Server, CT scanners and PACS reading stations. It is a tool to analyze CT angiographic data including stenosis analysis, thrombus, pre and post stent planning procedures, and directional vessel tortuosity visualization. Autobone provides zero-click bone segmentation for head, neck and other anatomy. The automation and ease of use streamlines workflow.

What's new

- Automated detection of aorta and iliacs with auto-labeling of vessels
- Automated real-time fast tracking for all vasculature
- New contextual wheel menu including easy access to advanced options
- New centerline edition capabilities
- Improved predefined measurements and edit capabilities
- New reporting interface which includes measurements in summary table
- New user interface

Features

- Anatomy based protocols for guided workflow in the analysis for your peripheral vascular CTA acquisitions. 8.4.3
- Automatic bone removal for efficient review of vasculature.
- Automated abdominal aorta CTA protocol with vessel tracking and vessel labeling.
- Fast tracking detects entire length of vessel and displays the centerline based on a single start point.
- Advanced editing tools bringing new flexibility for faster editing based on targeted anatomy.
- Thrombus detection with measurements and comparison over time.
- Dynamic AVA provides access to vessel tracking at any time, from any protocol, on any vessel.
- Advanced measurement tools for stenosis detection and color identification of HU value for quantification of different densities.
- Create a queue of cases that are pre-loaded and pre-processed in the background while you read another exam.
- Measurements are organized in the summary table allowing for easy viewing and exporting.
- Fully customizable workflows with adjustable layouts, personalized parameter and settings, custom review steps.
- Save State lets you save and restore the state of the processed images at any stage

System Requirements

VesselIQ Xpress with AutoBone option can be installed on GE's AW workstation or AW Server with VolumeShare 5, VolumeShare 7 or later software.

Compatible hardware VolumeShare 5:

- 8400, 8600, Z800 workstation
- AW Server 2.0

Compatible hardware VolumeShare 7:

- Z800, Z820 (and later)
- AW Server 3.1 and above (recommended monitor resolution is up to dual 2MP (1600 x 1200) or a single 3MP (1536 x 2048)
- Centricity™ Universal Viewer

Indications for Use

VesselIQ Xpress is intended to provide an optimized non-invasive application to analyze vascular anatomy and pathology and aid in determining treatment paths from a set of Computed Tomography (CT) Angiographic images. VesselIQ Xpress is a post processing application option for the Advantage Workstation (AW) platform, CT Scanner or PACS stations, which can be used in the analysis of 2D and 3D CT Angiography images/data derived from DICOM 3.0 compliant CT scans for the purpose of cardiovascular and vascular disease assessment. This software is designed to support the physician in assessment of stenosis analysis, pre/post stent planning and directional vessel tortuosity visualization.

VesselIQ Xpress automatic visualization tools provide the users with the capabilities to facilitate segmentation of bony structures for accurate identification of the vessels. Once vessels are visualized, tools are available for sizing the vessel, analyzing calcified and non-calcified plaque to determine the densities of plaque within a coronary artery, measure areas of abnormalities within a vessel. VesselIQ Xpress is a software post processing option for the Advantage Workstation (AW) platform, which can be used in the analysis of the 3D Angiography data. It provides a number of display, measurement, and batch filming/archive features and will aid physicians in studying user selected vessels for stenosis analysis, pre/post stent planning, and directional vessel tortuosity visualization.

AutoBone Xpress option is a software package that is intended to facilitate segmentation of bony structures and calcifications from abdominal and extremity CT Angiography data.

Regulatory Compliance

This product complies with the following requirements:

- European Council Directive 93/42/EEC concerning medical devices.

GE imagination at work

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Doc1471990.

Disclosure of Residual Risks

The disclosure of residual risks, according to EN ISO 14971, is providing relevant information so the users can make informed decisions on the use of the product.
Residual risk disclosure is covered in this Safety chapter listing the Cautions and Warnings of the product.

Intended Use

Thoracic VCAR is a CT, non-invasive image analysis software package which may be used in conjunction with CT lung images to aid in the assessment of thoracic disease diagnosis and management.

Indications for Use

8.4.4 Thoracic VCAR is a CT, non-invasive image analysis software package, which may be used in conjunction with CT lung images to aid in the assessment of thoracic disease. The software provides automatic segmentation of the lungs and automatic segmentation and tracking of the airway tree. Thoracic VCAR also provides quantification of Hounsfield units and display by color of thresholds within a segmented region.

Thoracic VCAR also supports Gemstone Spectral Imaging (GSI) acquisitions for the evaluation of pulmonary perfusion. It provides additional information to aid in visualization of variations of perfusion within the lungs and to quantitatively assess lung volumes. It is intended to be used as an adjunct to current standard methods utilizing color coded displays of iodine attenuation differences in the lungs to aid in identifying segments of relative perfusion differences which may be useful in assessing thoracic disease. Thoracic diseases that may be associated with changes in perfusion include pulmonary embolism and COPD.

CAUTION

Thoracic VCAR is an image post-processing software that should not be used as the only method for diagnosis.

User Profile

The intended users of Thoracic VCAR shall be technologists, radiologists and pulmonologists educated in the anatomy of the chest and lungs.

GE Healthcare

OncoQuant™

Robust tools for routine Oncology diagnosis, treatment follow-up, reporting and clinical trial management.

Oncology follow-up exams make most of routine studies. Due to the expanding breadth of data associated with today's multi-modality, multiple time-point Oncology studies, reviewing these exams can be time-consuming and labor-intensive. AW's Oncoquant application is designed to help organize and display your Oncology data to facilitate your quick review. Both your routine comparisons and advanced clinical evaluations may benefit from the OncoQuant workflow to navigate through findings and interact with results.

Overview

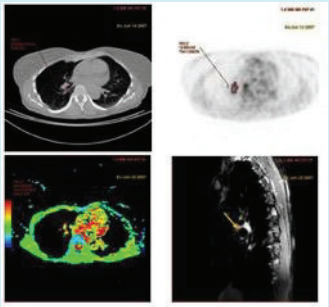
OncoQuant medical diagnostic software streamlines Oncology reading so you can spend less time retrieving studies and preparing exams, and more time reading and reviewing. A true cross-modality Oncology reading platform,
OncoQuant helps you correlate and compare CT, MR, PET/CT, and 3D X-ray data. It automates workflow to facilitate comparisons over time and makes reviewing follow-up exams efficient. The Oncology Review protocol and follow-up wizard simplify your assessment, characterization and measurement of findings on the basis of morphologic criteria.

OncoQuant is available on VolumeShare 7, a multi-modality advanced visualization workflow solution that helps to enhance diagnostic precision and productivity.

Highlights

- Automatic multi-modality image registration at loading for two or more exams.[1]
- Adaptable workflow supports standard criteria such as RECIST 1.0, 1.1,[2] WHO.[3]
- Dedicated automatic review protocols helping to identify and load like series.
- Right-click menu workflow measurements at baseline and follow-up.
- Intuitive, interactive Summary Table.
- Single-click Quick Report displaying up to four dates including Baseline, Nadir, Prior, and Current exams.
- Support of Chinese, Japanese, Korean and Russian languages.[4]

8.4.6



Visit us:
www.gehealthcare.com/aw/applications/oncoquant/

OncoQuant

OncoQuant's versatility and flexibility help streamline your reading and reporting workflow. For both routine analysis and research oriented purposes, OncoQuant quantifies and correlates data from disparate modalities to give you a comprehensive picture of any abnormality.

Features Details

Automatic Registration/Synchronization[1]

Automatic Registration/Synchronization allows multiple exams to be registered simultaneously and the registered results to be saved. This registration technique streamlines follow-up workflow and, by matching and displaying common anatomical locations from different studies, facilitates correlation among multiple modalities.

Dedicated protocols for intelligent review, comparison, and follow-up

8.4.5, 8.4.6

The Oncology Review Protocol makes review of Oncology images in busy clinical settings efficient. For follow up exams, OncoQuant automatically registers images[1], and then initiates an automatic like-series selection based on the content of the latest prior Save State series.

All loaded exam series are displayed in a dedicated Oncology Review layout, which maximizes available monitor space and displays like-series side by side. This protocol helps streamline workflow by suggesting target types to lesions/ abnormalities based on the rules of a standard you selected, e.g. RECIST 1.0, RECIST 1.1, and WHO classifications.[2,3] If you select the RECIST 1.1 criteria, OncoQuant suggests a target lesion when it is greater than 10mm in the baseline study.

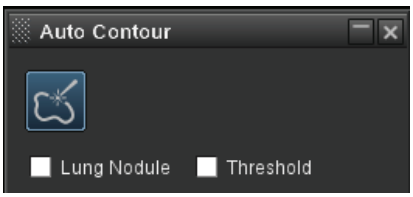
For research, you can define your own customized criteria to evaluate findings and track response to therapy, or you can add additional standards like Cheson, CHOI, etc. During review, the Summary Table collects findings and measurements for efficient reporting.

When reviewing exams with standard Volume Viewer protocols, such as VV General Review, OncoQuant gives you the flexibility to perform routine functions, such as optimally organizing an image display for exam comparison, or specialized tools, such as using oncology morphologic criteria.

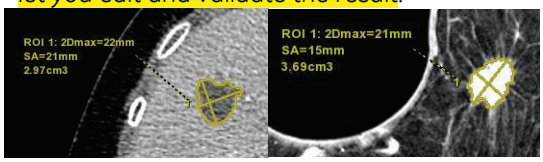
Advanced Visualization tools

Multi-Modality Contouring:

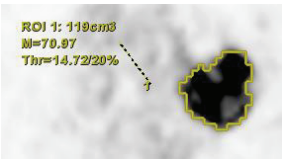
- Autocontour gives you consistent tools for multi-modality review and comparison: the same contouring tool with the same workflow supports CT, MR, and PET images.



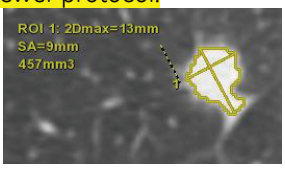
- For CT and MR images, the contouring tool will suggest contour boundaries of structures and let you edit and validate the result.



- For PET images, the contouring tool has been adapted for standard SUV calculations.

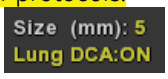


- If Lung VCAR is available (purchase option), then the algorithm for CT lung nodules is accessible when you need to evaluate, segment, and label lung nodules from any Volume Viewer protocol. 8.4.4



Lung Nodules:

- Lung VCAR (purchase option sold separately) combined with OncoQuant provides a Digital Contrast Agent (DCA) overlay feature that highlights, with adjustable sensitivity, suspicious areas in all reformat planes from the Volume Viewer protocols.



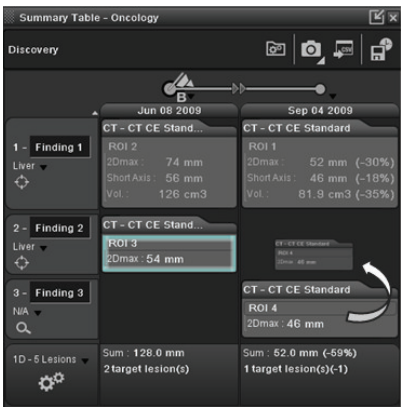
Summary Table 8.4.6

The Summary Table collects measurements and organizes them according to finding and exam date. OncoQuant brings several flexible features to the Summary Table.

The intuitive interactive Summary Table is an effective data manager, and allows you to quickly navigating through findings. You have access to the following options:

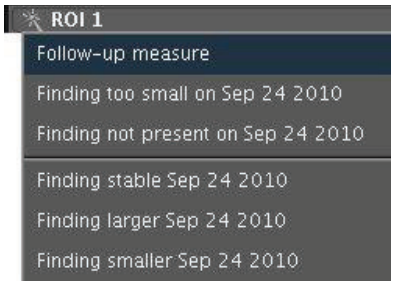
- **Baseline and Follow Up Management:** The graphic date line shows the date of the baseline (Reference) exam and the NADIR.[4] The sliding indicator provides an easy way to track measurements and evaluate trends.

- **Drag and Drop Measurements:** Measurements can be dragged and dropped in order to :
  - Link one measurement to a similar measurement in another finding.
  - Unlink a linked measurement in a new finding.

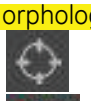


Follow Up Wizard: The follow-up wizard facilitates measurement workflow by selecting the same tools utilized in the prior reviews. The wizard also rapidly navigates to the prior findings locations. This allows you to quickly perform follow up measurements. 8.4.5, 8.4.6

It also facilitates the assessment, characterizations and measurements of morphological changes over time.



- **Target Type Selection:** With Oncology Review, target type is set automatically when the lesion anatomy is identified, based on selected morphological criterion:


Target Lesion (must be measurable at baseline).

Non-Target Measurable Lesion.

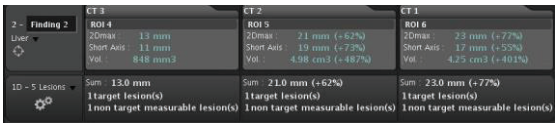
Non-Target Non-Measurable Lesion.

Standard Finding (incidental findings...).

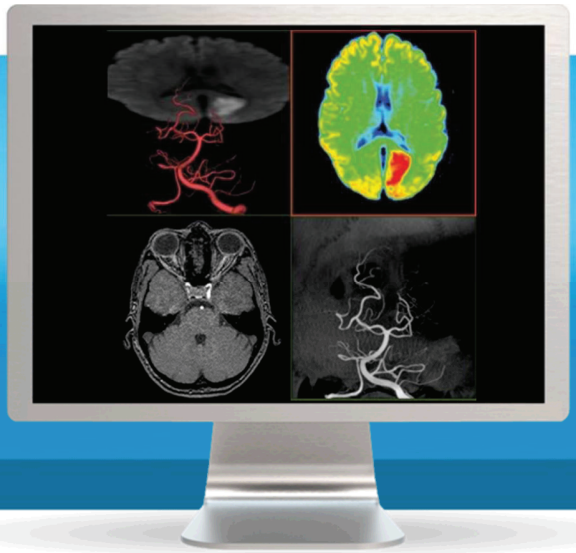
New Lesion.

You can manually change the automatic designation. When using other protocols, the target type must be manually set.

- **Research Tools:** The Summary Table supports a research-driven workflow with tools that conform to standards such as RECIST (1.0, 1.1) and WHO, and it offers you the capability to easily customize morphologic data and set specific rules for 1D, 2D, and 3D criterion types.
  Morphological evaluation outputs (sum and count) are displayed in the bottom of the summary table for each date. The example below shows RECIST 1.1 criteria at three time points for one target and one non-target lesion.



GE Healthcare



Integrated Registration

Multi-Modality Image Management

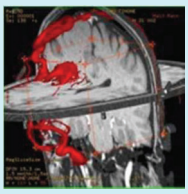
In Radiology practice today, multiple complementary imaging modalities are frequently relied on to image the same patient, as each modality provides unique anatomical and physiological information. 3D modalities such as CT and MRI provide information about the relationship of anomalous findings to surrounding structures and tissues. The Integrated Registration application
8.4.9 provides you with a streamlined workflow to combine and display images from any two of the five major modalities (CT, MR, PET, SPECT, and X-ray angiography), aimed at improving your ability to provide more clinically relevant diagnostic information, and improving surgical and treatment planning.

Overview

Integrated Registration provides you with the capability to align and fuse two volumetric acquisitions from either the same or different acquisition modalities. With it, you can easily compare 3D anatomical images from CT, MR with PET, SPECT, and X-ray angiography[1] for a comprehensive analysis.

Highlights

- Load and register on the fly with drag and drop.
- Easy registration using automatic, manual and landmark methods.
- Multiple 2D and 3D fusion capabilities.
- Automatic registration propagation across series and one-click access to pre-defined protocols. 8.4.9
- Rigid and deformable registration.
- Drawing and saving of contours as RTSS DICOM objects.
- Access to regional registration on the fly for an easy review of challenging areas.
- Compatible with GE Advantage SIM MD and other standard treatment planning software.



Visit us:
www.gehealthcare.com/aw/applications/integrated-registration/

Accutron® CT-D Vision

The New Diagnostic Specialist

10.1

The Accutron® CT-D Vision is designed for the precisely dosed injection of contrast medium (CM) and saline solution (NaCl) in computed tomography. It features an injection unit with two independently controllable drive units, so that the contrast medium can be positioned variably and precisely in the examination area with the aid of saline solution, depending on the application.

The Accutron® CT-D Vision is also designed for use in contrast-enhanced mammography.

Easy Filling

Automatic filling or manual filling with variable speed

Filling speed: 1 – 5 ml/s

Optimized tube systems with check valves

Wireless & Mobile

Mains supply independent thanks to high-output rechargeable batteries

Input voltage charger: 100 – 240 V, 50 – 60 Hz

Power consumption charger < 100 VA

Mindful Workflow

Two-step launching process and Pre-inject function controlled via the start/stop hand switch provide precise monitoring

SMART Assist offers an automated workflow

Hygienic Design

Tough, stable and light aluminum casing

Easy to clean and hygienic

Total weight: 26 kg

Disposable recommendations

Single Use

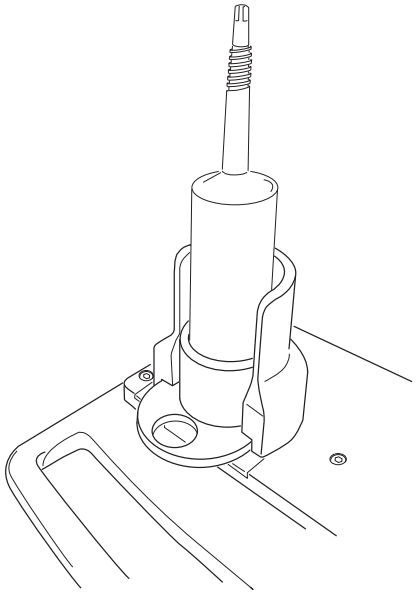
	Artikelnummer
2 x ELS 200 ml Syringe	316026-000
1 x MR-ELS Tube System with 2 Valves, green	317104-000
2 x Vented Spike	319095-100

Multiple Use up to 8h

2 x ELS 200 ml MU Syringe	314626-100
1 x Double Head 8h Tube System	314119-100
1 x Vented Spike	314095-100
1 x Coiled Patient Line with Valve 150 cm	318214-000

Multiple Use up to 24h

2 x Day Safe Syringe 200 ml	312426-100
1 x Day Safe Filling Tube Type D	312400-100
1 x SUre Patient Line	318415-100
2 x Vented Spike	314095-100



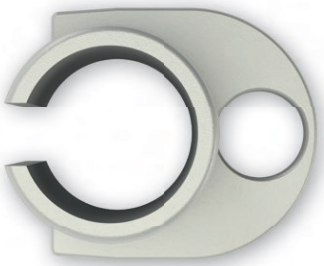
Works with Select Pre-filled Syringes

For quick use and faster patient turnaround times. The adapter and software are optimized for Optiject pre-filled syringes. Direct selection of syringe size under injection parameters. Available sizes range from 75 ml up to 125 ml.

10.3

Easy Loading

Syringe (ELS)



200 ml
Crystal clear syringes

Slide turn
Slide and turn to install

Fixed luer
Half turn to easily connect line's hubs

Quick remove
Removable in any position of the piston

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Injector settings

You can make various settings for the injector and activate and deactivate functions here.

- Tap the **Injector settings** button.

The following window is displayed:

Setting the standby time

Under the menu item **Standby time** you can define after how many seconds the injector should switch to standby mode when it is not being used.
The injector only switches to standby mode when the main window is shown in the display. The display lighting switches off in standby mode. This saves energy. The switched-off display can be reactivated at any time by tapping anywhere on the display.
30 – 600 s can be set.

Setting the empty syringe speed of the pistons

Under the menu item **Empty syringe speed** you can set the speed at which the empty pistons should be moved.
1 – 10 ml/s can be set.

Setting the filling speed of the pistons

Under the menu item **Filling speed** you can set the speed at which the liquids should be filled.
1 – 5 ml/s can be set.

10.2

Switching the CM/NaCl heating on/off

Under the menu items **CM Heating** and **NaCl Heating** you can switch the heating of the respective recipient on or off.

The current setting is shown on the corresponding button.

– Function activated

– Function deactivated

Proceed as follows to switch the heating on or off:

- Tap the relevant button.

The new setting is shown on the button.
If the heating is switched on, a corresponding symbol is also shown at the top of the display.

Activating/deactivating SMART Assist

Under the menu item **SMART Assist** you can activate or deactivate the SMART Assist function. When SMART Assist is activated, the injector provides a more automated workflow. See also the section *Working with SMART Assist* on page 99.

Note!
If the IDS DICOM software option has been enabled for your device, the SMART Assist function is automatically disabled and cannot be activated.

The current setting is shown on the button.

– Function activated

– Function deactivated

Proceed as follows to activate or deactivate the function:

- Tap the button.

The new setting is shown on the button.

- A single service engineer can safely perform servicing of the table. Ensure sufficient clear space to maintain egress clearances with the table covers or cradle removed.
- A single service engineer can safely perform servicing of the system. Ensure sufficient clear space to maintain egress clearances with covers or cradle removed.
- A tube change box is 1016 mm (L) x 711 mm (W) x 737 mm (H) (40 in. x 28 in. x 29 in.), if the handles are extended, the box dimension is 1813 mm (L) x 711 mm (W) (71 in . x 28 in.). The box rolls like a wheelbarrow and must have access to the right side of the gantry. It is the PMI's responsibility to demonstrate that the tube change box can be positioned in the tube change area next to the gantry and that the front and rear covers can be removed.

5.2.3 Power Distribution Unit (PDU)

When positioning the Power Distribution Unit (PDU), consider regulatory compliance, as defined in 4.1 Regulatory Clearances on page 19. See Table 4-2 PDU — Minimum Workspace Clearances on page 24 in that section.

5.2.4 Console

As some service activities require access to the rear of the console, be sure to maintain sufficient space for moving the console to allow rear service access.

See Figure 6-3 Typical Control Room Layout on page 42 for a typical control room layout.

5.2.5 Storage Cabinet

GE Healthcare provides a storage cabinet (see Note below) for storing all supplied service equipment (see Table 5-1 Equipment Stored in Storage Cabinet on page 34). Situate this storage cabinet within the scan room suite area to allow easy service access. The dimensions of the cabinet measure 610 mm D x 914 mm W x 1067 mm H (24 in. D x 36 in. W x 42 in. H), complete unit not to exceed 68kg (150 lbs) (empty).

NOTE

A storage cabinet is provided as option (B77292CA).

Table 5-1 Equipment Stored in Storage Cabinet

Item	Size	Weight (total)	
11.3 QA Phantom (water filled)	20 cm x 15 cm (7.9 in. x 5.9 in.)	5.5 kg	12 lb
Phantom Holder	25 cm x 25 cm (9.8 in. x 9.8 in.)	3.6 kg	8 lb
FE Box (Purple)	30 cm x 38 cm x 30 cm (11.8 in. x 15 in. x 11.8 in.)	6.8 kg	15 lb
Install Support Kit (box)	30 cm x 30 cm x 38 cm	9.1 kg	20 lb
Three Piece Tube Hoist Assembly	77 cm x 8 cm and 38 cm x 15 cm (30.3 in. x 3.1 in. and 15 in. x 5.9 in.)	9.1 kg	20 lb
Balance Weight Kit		33 kg	73 lb
Front Cover Dollies	85 cm x 20 cm and 85 cm x 15 cm (33.5 in. x 7.9 in. and 33.5 in. x 5.9 in.)	~15.9 kg	35 lb

Maintenance, Cleaning and Disinfection

- To guarantee safe, reliable equipment performance, the site must be prepared according to GE Healthcare requirements, as specified in the Pre-Installation Manual.
- There are no user serviceable parts in this system. The product should be installed, maintained, and serviced by qualified service personnel according to procedures laid down in the product service manuals.
- The system in whole or in part should not be modified in any way without prior written approval by GE Healthcare.
- Planned maintenance must be carried out regularly to ensure safe operation of the equipment.
- For user maintenance of the system and performance tests, refer to the maintenance and calibration information in the Technical Reference Manual.

Environmental concerns

This symbol indicates that the waste of electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.

General Cleaning and Disinfection

General Cleaning Background: cleaning should be done by site personnel (e.g., technologists or housekeeping personnel) unless otherwise indicated in the following maintenance schedules.

Keep the equipment clean. Remove body fluids and / or contrast spills to prevent health risk and damage to internal parts. Thorough cleaning, including prompt removal of soil, is essential for adequate processing and will reduce the risk of infection for patients.

When using any open cell foam (sponges without coating), always place a barrier between the patient's skin and the sponge. If sponges are soiled, discard them as they cannot be cleaned or disinfected.

Ensure system components or accessories are not worn out, cracked, or torn to ensure proper cleaning and disinfection. Replace worn out components or accessories immediately.

11.4

Item	Required Maintenance	Service Interval
General	Clean	As required
Patient Cradle	Clean pads and inside of the cradle.	Between each patient
Pads, Straps, Patient Accessories	Clean all areas that were touched by the patient. Clean other areas as needed	Between each patient
Head Holder Insert	Inspect for bodily fluids, dispose and replace if saturated	Between each patient

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System startup and shutdown

To keep your system operating at optimal performance, restart your system once every 24 hours. It is recommended you shutdown and restart the system at the end of the last shift. If the system has a persistent problem, record the time, circumstances, and error messages, and then call service.

Upon startup, you may see evidence that an automatic software download occurred. The option to automatically install the updates is provided during system startup. See **Download software**.

Performing a **QuickSnap**, an **SPR Snap** and /or **IQ Snap** provides additional information to aid the service engineer in the resolution of issues.

Login/Logout

The login feature requires that you login to access the system for **data privacy**. It can be turned on or off by your system administrator or Field Engineer. How your site uses this feature depends on if your site has a central user repository to which the system is connected. Sites with networks are referred to as Enterprise systems, those without are referred to as stand-alone systems. This feature can be used with either configuration, although some features are more applicable to enterprise systems.

Logging off does not prohibit other users from logging in. Logout is designed to protect patient privacy, not stop approved users from logging in. When you or another user logs back in, the system returns to its last known state.

Prepare the system

- Clean the Accessories and check for damage.
- Check and remove dried contrast agent from:
  - Mylar ring (around the gantry opening)
  - Table extension and cradle surfaces — especially the Patient Restraint plastic channels on the table
  - 11.4 Accessories (Head holders, pads and cushions, etc.)
- Check supplies.

Check Disk Space

Maintain Image file space on the disk, because the system refuses to scan when it runs out of file space.

Check Image Space

- Check the daily schedule, and multiply the list of patients by the estimated number of images each study requires.
- Compare your estimate to the *remaining* 512^2 images listed in the Feature Status **Date** and **Time** area.
- If your estimate exceeds the available Image Space:
  - Film any previously unfilmed studies. (Optional)
  - Transfer designated images to another suite or console.
  - Archive and remove the oldest images from the system disk.

Always follow the filming and archive routines established for your facility.

Do not remove images while actively scanning patients.
Do not reboot the system immediately after removing images, this can cause mismatch of information in the patient list.

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9.4 Electro-Magnetic Interference (EMI)

9.4.1 Gantry

Locate the gantry in ambient static magnetic fields of less than 10^{-4} tesla (1000 milligauss) to guarantee the specified imaging performance. Ambient AC magnetic fields must measure below 10^{-6} tesla (10 milligauss) peak.

9.4.2 Console / Computer Equipment

Locate computer equipment in ambient static magnetic fields of less than 10^{-3} tesla (10,000 milligauss) to guarantee data integrity (see Figure 9-3 Sample Room Layout (Showing Approximate EMI Requirements) on page 101).

9.4.3 PDU

The PDU produces an electromagnetic field that radiates outward from its cabinet in all directions. Do not place the gantry or patient table within 0.3 meters (12 inches) of the edge of the Power Distribution Unit/Adapter. Do not place other sensitive electronics (e.g. the operator console or computer equipment) within 1.0 meters (39 inches) of the edge of the Power Distribution Unit in any direction, including above or below it. The UPS is not classified as sensitive electronics. (see Figure 9-3 Sample Room Layout (Showing Approximate EMI Requirements) on page 101).

11.5 **9.4.4 UPS**

The Uninterruptable Power Supply (UPS) provides a consistent power supply to various electrical components of the system. Also, it continues to provide electrical power to components during a site-wide power outage so components can be safely shut down. The UPS should be kept at least one meter (1 m) (3.28 ft.) away from sensitive electronics (the PDU does not include sensitive electronics).

9.4.5 EMI Reduction

If you suspect the presence of fields of excessive EMI, consult GE Sales & Service for recommendations. Consider the following when attempting to reduce EMI:

- External field strength decreases rapidly with distance from source of the magnetic field.
- External leakage magnetic field of a three-phase transformer measures much less than that of a bank of three single-phase transformers of an equivalent power rating.
- Large electric motors constitute a source of substantial EMI.
- High-powered radio signals constitute a source of EMI.
- Maintain good screening of cables and cabinets.
- Consider and measure EMI fields of sites with main facility power running UNDER the floor or WITHIN the walls or ceilings of the scan room.
- Pay special attention to power substations and high-voltage power lines in proximity to the scan facility.
- If any concerns remain regarding excessive EMI fields, be sure to measure to confirm that your site meets all required specifications.

6

Chapter 6 Room Sizes

6.1 Room Dimensions

Table 6-1 Scan Room Minimum Size Dimensions

14.

System Configuration	Minimum Room Size
System with GT2000 Table	6223mm * 3327 mm (20.4 ft * 10.9 ft)
System with GT1700V Table	5563 mm * 3327 mm (18.3 ft * 10.9 ft)
System with Lite Table	5377 mm * 3327 mm (17.6 ft * 10.9 ft)

NOTE

All service/regulatory requirements apply in accordance with country specific regulations.

All service/regulatory requirements apply, with the addition of no energized left-side service. Minimum room size includes Axial Head Holder and Extender.

6.1.1 Suggested Room Size

The suggested room configuration offers the most flexibility for future upgrades. It provides both ample workspace and space to add mill-work and still meet all regulatory requirements. When local regulations require a sink in the scan room, this room size also provides sufficient space for a sink. This room size accommodates the needs of larger hospitals and medical teaching facilities, where patients may require transportation to the scan area in beds, gurneys, and larger wheelchairs and where they may require the assistance of larger medical care teams. Likewise, this room offers adequate access for crash carts and other emergency medical equipment on both sides of the table. Future upgrades may need additional equipment. You may want to consider an equipment room. The suggested size supports all service activities, including tube change, and accommodates all future two-step installations.

6.1.2 Typical Room Size

The typical room configuration represents what is most commonly found at installation sites. It offers adequate workspace and may provide adequate space for a sink, but allows only LIMITED space to add mill-work and still meet all regulatory requirements. The size of this room accommodates the needs of larger clinics and medium-sized hospitals, where patients may require transportation into the scan area using gurneys and wheelchairs, and where they may require the assistance of small medical care teams. It provides access for crash carts and other emergency medical equipment on only one side of the table.

The typical room size supports all service activities, including tube change, and may offer compatibility with SOME future upgrades and two-step installations.

6.1.3 Minimum Room Size

The minimum room configuration represents the smallest functionally acceptable space for this product and represents the type of room often found at doctor's offices and smaller clinics and outpatient facilities. Due to its limited size, and to functional and regulatory requirements, this room usually provides only LIMITED workspace, and leaves to NO space to add in-room millwork and sinks and still meet the necessary regulatory and service requirements. This room can accommodate the

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Įmonės kodas - 124942182, PVM mokėtojo kodas - LT249421811

Lietuvos sveikatos mokslų universiteto ligoninei Kauno klinikoms

DĖL ATITIKIMO VIEŠOJO PIRKIMO REIKALAVIMAMS
(PIRKIMO ID 607586)

2025-02-03 Nr. 20250203-LVS
Vilnius

Šiuo patvirtiname kad, siūlomo kompiuterinės tomografijos aparato Revolution Maxima rentgeno vamzdžiui suteikiamos garantijos trukmė yra 38 mėnesiai.

Direktorius plėtrai Laurynas Vaškys