VAMC SAN FRANCISCO, CA
PO# 662-B30013

# MAGNETOM Aera - USA

**All items listed below are included for this system:** *(See Detailed Technical Specifications at end of Proposal.)*

| Qty | Item Description |
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**1**

### MAGNETOM Aera - System

MAGNETOM Aera - 1.5T Tim+Dot system - The integration of the next generation Tim - "Tim 4G" and the Siemens unique Dot Engines (Day optimizing throughput Engine). Short and open appearance (145 cm system length with 70 cm Open Bore Design). Tim 4G's redesigned RF system and all-new coil architecture. - Siemens unique DirectRF(tm) technology enable Tim's new all digital-in/ digital-out design - All-new coil architecture including Dual-Density Signal Transfer Technology - Whole-body superconductive Zero Helium Boil-Off 1.5T magnet - TrueForm Magnet and Gradient Design - Actively Shielded water-cooled Siemens gradient system - Head/Neck 20 DirectConnect, Spine 32 DirectConnect, Body 18, Flex Large/Small 4 Dot offers patient personalization, user guidance and process automation that result in consistent examination results. - Brain Dot Engine is designed to simplify general brain examinations through personalized, guided and automated workflows. - Dot Display and Dot Control Centers - efficient patient preparation. Additional features include: -Tim Application Suite including Neuro, Angio, Cardiac, Body, Onco, Breast, Ortho, Pediatric and Scientific Suite - syngo MR software including 1D/2D PACE, syngo BLADE, iPAT², Phoenix, Inline Technologies. - High performance host computer and measurement and reconstruction system The system (magnet, electronics and control room) can be installed in 30sqm space. For system cooling either the Eco Chiller options or the Separator is required.

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### Tim [204x48] XQ Gradients #Ae

Tim [204x48] XQ-gradients performance level Tim 4G with it's newly designed RF system and innovative coil architecture enables high resolution imaging and increased throughput. Up to 204 simultaneously connected coil elements in combination with the standard 48 independent RF channels, allow for more flexible parallel imaging. Maximum SNR through the new Tim 4G matrix coil technolgy. This option includes also Advanced High Order Shim. XQ - gradients The XQ- gradients are designed combining high performance and linearity to support clinical whole body imaging at 1.5T. The force compensated gradient system minimizes vibration levels and accoustic noise. The XQ gradients combine 45 mT/m peak amplitude with a slew rate of 200 T/m/s.

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### PC Keyboard US english #Tim

Standard PC keyboard with 101 keys.

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### Pure White Design #T+D

The MAGNETOM Aera / MAGNETOM Skyra design is available in different light and appealing variants which perfectly integrates into the different environments. The color of the main face plate cover of the Pure White Design Variant with the integrated Dot Control Centers and the unique Dot Display is brilliant white surrounded by a brilliant silver trim. The asymetrical deco area on the left side is colored white matte and also with a brilliant surrounding silver trim. The table cover is presented also in the same color and material selection.

## Tim Dockable Table #Ae

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The new Tim Dockable Table is designed for maximum patient comfort and smooth patient preparation. Tim Dockable Table can support up to 250 kg (550 lbs) patients without restricting the vertical or horizontal movement. The one step docking mechanism and the innovative multi-directional navigation wheel ensure easy maneuvering and handling. Critically ill or immobile patients can now be prepared outside the examination room for maximum patient care, flexibility and speed.

## syngo.via Advanced User #1

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One Advanced User License of the syngo.via client server solution for multi-modality image reading. It provides 2D, 3D, 4D image reading capabilities at almost every workplace for various modalities (e.g. CT, MR, PET/CT, CR, XA image types). The syngo.via client runs on standard Windows computers in the network and integrates into radiologist's reading workplace (RIS; PACS) for efficient image reading based on a wide range of imaging applications (advanced visualization applications) for different clinical cases. Those applications are available as additional options for syngo.via. The syngo.via licensing model is flexible and tailored to the number of concurrent users (users working at the same time). The service support for syngo.via requires the provision of an administrator with dedicated tasks and a minimum broadband Internet connection bandwidth.

## syngo.MR General Engine #1

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The syngo.MR General Engine extends syngo.via by adding software for professional and routine MR radiology usage. It includes workflows for dedicated MR examinations that load and structure examination results automatically into meaningful layouts including user support to make sure that no data is missed. syngo.MR General Engine contains several MR Radiology workflows, cardiovascular workflows and MR Evaluation features.

## syngo.MR Cardiac 4D Ventr. Funct.#1

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syngo.MR Cardiac 4D Ventricular Function processes MR cine images of the heart and generates quantitative results for physicians in the diagnostic process. MR cardiac interactive reporting template included.

## syngo.MR Cardiac Flow #1

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syngo.MR Cardiac Flow processes velocity-encoded MR images to evaluate blood flow dynamics e.g. in the heart and the great vessels. The application generates quantitative results for physicians in the diagnostic process. The MR cardiac interactive reporting template is included.

## syngo Tissue 4D #MM

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syngo(r) Tissue 4D is an application for visualizing and post-processing dynamic contrast-enhanced 3D datasets. This card provides two evaluation options: - Standard curve evaluation - Curve evaluation according to a pharmacokinetic model

## Server HW Config XL

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syngo.via server hardware configuration XL

## Software License Ext. Server HW XL

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Mandatory license extension for embedded applications on Hardware systems with more than one CPU. Second CPU license.

## HP Care Pack. 5y 24x7 HW Support

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HP Care Pack Services upgrade or extend the standard warranty with enhanced, customized on-site and remote support for hardware for 5 years.

## Monitor for Administration

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HP TFT 20" flat screen monitor for syngo.via administration display. Display Size: 20" (48,1 cm) wide Weight ca. 7,4 kg

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| 1 | **syngo MMWP Client #1** |
| | This is a syngo MultiModality Workplace advanced post-processing workstation, comprising Windows XP PC with syngo(r) base user software, syngo 3D, syngo Expert-i and monitor. The syngo MMWP Client workplace is already prepared for advanced 3D post-processing regarding hardware performance and graphics card. The software functionality can be extended to suit specific user clinical needs by adding optional cross-modality and modality-specific application modules. |
| 1 | **Modality Integration MR** |
| | Modality integration of the syngo MMWP Client with primary use MR |
| 1 | **syngo Keyboard USA English** |
| | English (US) syngo(r) keyboard |
| 1 | **PACS-Driven Implementation Pkg.** |
| | This PACS-Driven Implementation Package includes installation and integration services for syngo.via in a radiologic workflow mainly supported by the PACS functionality. This package includes professional services, such as: - Installation of the syngo.via server software on the server hardware  - Installation of the syngo.via client software on one clinical workplace for one user - Connection to up to 5 DICOM nodes - Image call-up of syngo.via from the PACS' user interface - Integration of syngo.via into the IT infrastructure using Active Directory, if applicable - Configuration of basic syngo.via workflows and rules - Integration of one syngo.via client workplace with one syngo MultiModality Workplace 2009A. |
| 1 | **Server HW Installation Service** |
| | Basic installation service for the syngo.via server hardware with the operating system at the customer's site.  Integration into the Local Area Network of the customer and to Siemens Remote Service over internet connection. |
| 1 | **MMWP Client HW Implemention Service** |
| | Implementation services for one syngo MultiModality Workplace include the tasks for installation, configuration and integration of one syngo MMWP 2010A (VE40A). |
| 1 | **VIA Govt Trng in PACS Imp** |
| | Per agreement, credit for initial training in Basic Implementation 14412663 |
| 3 | **VIA Govt Server HW Install** |
| | Per agreement, credit for syngo.via hardware installation by 3rd party integrator 14412656 |
| 3 | **Apps Training and Basic Config 1day** |
| | Apps Training and Basic Config 1day  On-Site Application Training - targeted to give the user a solid base for understanding and applying syngo.via workflows and to operate the system within the clinical routine. The training is focused on three key users which have to be selected. |
| 1 | **syngo.via for Clinical Administrators** |
| 1 | **Virtual syngo.via IT Admin Training** |
| 1 | **Native syngo #Tim** |
| | Integrated software package with sequences and protocols for non-contrast enhanced 3D MRA with high spatial resolution. syngo NATIVE particularly enables imaging of abdominal and peripheral vessels and is an alternative to MR angiography techniques with contrast medium, especially for patients with severe renal insufficiency. |
| 1 | **Abdomen Dot Engine #T+D** |
| | The Abdomen Dot Engine: Personalized Exam Strategies - Guidance - Automatic sequence scaling  - Auto Navigator - Auto-FoV - Timeline setup and monitoring - Automatic Voice Commands - Auto Bolus Detection - Inline radial range calculation for MRCP - Inline Subtraction - Inline Registration |

### Inline Composing syngo #Tim

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Automatic anatomical or angiographic composing of multiple adjacent coronal or sagittal images for presentation and further evaluation. Composed images can be automatically loaded into Graphical Slice Positioning for scan planning purposes.

### Tim Planning Suite

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With the Tim Planning Suite, multiple regions in the entire body can be examined in a minimum of time through measurement planning on a single FoV of any desired size.

### Tim Whole Body Suite #T+D

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Tim Whole Body Suite puts it all together. This suite enables table movement for imaging of up to 205 cm (6' 9") FoV without compromise. In combination with Tim's newly designed ultra highdensity array higher spatial and temporal resolution can be achieved along with unmachted flexibility of any coverage up to Whole Body. For faster exams and greater diagnostic confidence.

### Cardiac Dot Engine, USA #T+D

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Cardiac examinations: Dot Cardiac - Customized workflows that are easier to repeat. Using anatomical landmarks, standard views of the heart (such as dedicated long axis and short-axis views), are easily generated and can easily be reproduced using different scanning techniques. Scan parameters are adjusted to the patient's heart rate and automatic voice commands are given.

### Flow Quantification #Tim

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Special sequences for quantitative assessment of flow.

### Advanced Cardiac Package #T+D

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This package contains special sequences and protocols for advanced cardiac imaging including 3D and 4D syngo BEAT functionalities. It supports advanced techniques for ventricular function imaging, dynamic imaging, tissue characterization, coronary imaging, and more.

### AutoAlign Spine #Tim

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Single mouse click double oblique positioning of transverse slice packages in spine imaging. AutoAlign Spine localizes the intervertebral disk on sagittal images and positions the transverse slice packages parallel to the disk in a standardized way. This allows for a faster and easier exam and supports reading by delivering a higher and more standardized image quality.

### Inline Perfusion #Tim

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Automatic real-time calculation of Global Bolus Plot (GBP), Percentage of Baseline at Peak map (PBP), and Time-to-Peak map (TTP) with Inline technology.

### SWI #Tim

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Susceptibility Weighted Imaging is a high-resolution 3D imaging technique for the brain with ultra-high sensitivity for microscopic magnetic field inhomogeneities caused by deoxygenated blood, products of blood decomposition and microscopic iron deposits. Among other things, the method allows for the highly sensitive proof of cerebral hemorrhages and the high-resolution display of venous cerebral blood vessels.

### TWIST syngo #Tim

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This package contains a Siemens unique sequence and protocols for time-resolved (4D) MR angiographic and dynamic imaging in general with high spatial and temporal resolution. syngo TWIST supports comprehensive dynamic MR angio exams in all body regions. It offers temporal information of vessel filling in addition to conventional static MR angiography, which can be beneficial in detecting or evaluating malformations such as shunts. In case of general dynamic imaging, for example an increase in spatial resolution by a factor of up to 2 at 60 seconds temporal resolution (compared to conventional dynamic imaging) is possible due to intelligent k-space sampling strategies. Alternatively, increased temporal resolution at constant spatial resolution is possible.

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### Peripheral Angio 36 #Ae

The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technolgy combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility: - 36 channels - Dual Density Signal Transfer - Ultra light-weight - SlideConnect Technology  The 36-channel coil includes 36 integrated pre-amplifiers for excellent  signal-to-noise ratio. The single SlideConect Plug allows for fast and easy patient preparation.  The Peripheral Angio 36 features: - 36-element design with 36 integrated preamplifiers, distributed over 6 planes with 6 elements each  - Operates in an integrated fashion with Body 18 coils and with the Spine 32 . For Whole-Body examinations also with the Head/ Neck  20  - Automatic table feed and active coil switch - Can be utilized head and feet first - Both legs are independently covered with coil elements, maximizing the coil filling factor and the signal-to-noise ratio - No coil tuning - iPAT-compatible - Dual-Density Signal Transfer enables ultra-high density coil designs by integrating key RF components into the local coil - SlideConnect technology for easy coil set up - One cable only for easy handling - Includes special non-ferromagnetic coil cart for safe, user-friendly storage  Applications: - High-resolution angiography of both legs incl. Pelvis (by additional use of the Body 18) with highest signal-to-noise ratio - Visualization of the iliac arteries and aorta in combinaton with Body 18 - Bilateral examinations of long bones of the legs  Typically combined with: Head/ Neck 20, Body 18, Spine 32, and all flexible coils such as Flex Large 4 or Flex Small 4

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### Shoulder 16 Coil Kit #Ae

The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technolgy combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility. The Shoulder 16 Coil Kit for examinations of the left or right shoulder consists of a base plate and two different sized iPAT compatible 16 channel coils (Shoulder Large 16 and Shoulder Small 16). These will be attached and can be relocated on the base plate.The 16-element coils with 16 integrated pre-amplifiers ensure maximimum  signal-to-noise ratio. Shoulder Large 16 and Shoulder Small 16 will be connected via a SlideConnect plug for fast and easy coil set-up and patient preparation.

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### Tim Coil Interface 1.5T

Coil adapter plug for up to 8 receive and 1 transmit channels, in order to connect existing dedicated knee and breast coils (Tx/ Rx 15-channel Knee Coil, CP Extremity Coil, 4-channel Bl Breast Coil, 16-channel Al Breast Coil, 2/4/8-channel Sentinelle BreastCoil) with MAGNETOM Aera Systems.

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### Tx/Rx 15-channel Knee Coil #Ae

New 15-channel transmitter/receiver coil for joint examinations in the area of the lower extremities.  Main features : - 15-element design (3x5 coil elements) with 15 integrated preamplifiers,  - iPAT-compatible

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### Body 18 #Ae

The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technolgy combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility: - 18 channels (inherent) or up to 30 (in combination with the Spine 32) - Dual Density Signal Transfer - Ultra light-weight - SlideConnect Technology  The Body 18 is part of the standard configuration. The 18-channel coil with its 18 intergrated pre-amplifiers ensures excellent signal-to-noise ratio. The 18 coil elements provide extensive coverage in all directions. The single SlideConnect plug allows for fast and easy patient preparation. The light-weight coil ensures highest patient comfort.  The Body 18 Coil features: - 18-element design with 18 integrated preamplifiers (3 clusters of 6 elements each) - Operates in an integrated fashion with the Spine 32  as an 30 channel body coil - Can be combined with further Body 18 coils for larger coverage - Can be positioned in different orientations (0°, 90°, 180°, 270°) for patient specific adaptations - No coil tuning - iPAT compatible in all directions  The highly flexible design enables a wide variety of applications including: - Thorax (incl. heart) - Abdomen - Pelvis - Hip  Typically combined with: - Head / Neck 20  - Spine 32 - Additional Body 18 coil(s) (optional) - Peripheral Angio 36 (optional) - Flex Large 4  - Flex Small 4  - Loop coils (optional)  - Endorectal coil (optional)

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### MR Workplace Table 1.2m

Table suited for syngo Acquisition Workplace and syngo MR Workplace based on syngo Hardware.

| 1 | **MR Workplace Container, 50cm** |
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|  | 50 cm wide extra case for the syngo host computer with sliding front door to allow change of storage media (CD/DVD/USB). |
| 1 | **Coil Storage Cart #T+D** |
|  | Specially designed non-ferromagnetic cart for easy storage of the most commonly used coils and accessories. |
| 1 | **Eco Chiller 60kW** |
|  | The KKT ECO 133 -L chiller is a dedicated 20°C cooling system for MAGNETOM Aera and MAGNETOM Skyra which automatically adapts to the different cooling requirements (e.g. system in operation, standby, ...) to reduce the energy consumption for cooling. The cooling system must be used in combination with the IFP (Interface Panel), if there is no on-site chilled water supply at all. The IFP is included in the scope of supply. |
| 1 | **Seismic Kit** |
|  | Earthquake Kit for ECO Chiller 45 kW (PN 14416974 and 14432147) and ECO Chiller 60 kW (PN 14416975). Tested in accordance with "CBC 2010 Section 1708A.4.1" for the application in California, USA, resp. in accordance with IBC (International Building Code) for other countries like Japan, etc. |
| 1 | **UPS Cable  #Tim** |
|  | Power cable for connecting the UPS Powerware PW 9130-3000i (14413662) to the ACC of MAGNETOM Tim and MAGNETOM Tim+Dot systems for backing up the computer.   Standard cable length: 9 m. |
| 1 | **UPS Powerware PW9130G-3000T-XLEU** |
|  | UPS system Eaton PW9130G-3000T-XLEU for MAGNETOM Tim, MAGNETOM Tim+Dot and MAGNETOM Symphony systems for safeguarding computers. Power output: 3.0 kVA / 2.7 kW Bridge time: 5 min full load / 14 min half load Input voltage: 230 VAC |
| 1 | **UPS Battery module** |
|  | UPS battery module Eaton PW 9130N-3000T-EBM for all MAGNETOM Tim, MAGNETOM Tim+Dot and MAGNETOM Symphony systems for safeguarding computers. Extension for: PW9130i-3000T Battery type: Closed, maintenance-free Extension of the bridge time to: 24 minutes with a module Dimensions (H x W x D): Battery module: 346 x 214 x 412 mm  incl. bracket set Weight: approx. 50 kg |
| 1 | **Additional Set of Manuals** |
|  | Additional set of manuals for the above selected MR system. |
| 1 | **MR_GOV_RIG_INSTL** |
| 1 | **T+D Preinstall kit for dockable table** |
| 1 | **Standard Cryogens** |
| 1 | **MR Project Management** |
|  | A Siemens Project Manager (PM) will be the single point of contact for the implementation of your Siemen's equipment.  The assigned PM will work with the customer's facilities management, architect or building contractor to assist you in ensuring that your site is ready for installation. Your PM will provide initial and final drawings and will coordinate the scheduling of the equipment, installation, and rigging, as well as the initiation of on-site clinical education. |
| 1 | **Initial onsite training 32 hrs** |
|  | Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals.  Training will cover agenda items on the ASRT approved checklist. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours.  This educational offering must be completed (12) months from install end date.  If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund. |

**1**  **Follow-up training 32 hrs**

Up to (32) hours of follow-up on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.

**1**  **MR Dot Govt. Training Class (No T&L)**

Tuition for (1) government attendee to attend a Classroom Course of choice at one of the Siemens training centers. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.

**1**  **Additional onsite training 32 hours**

Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist if applicable.This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.

**1**  **Armrest #MR**

**1**  **Kraus Start-up and Warranty**

**1**  **Spectris Solaris EP Injector iCBC**

Includes Spectris Solaris EP injector and Integrated Continuous Battery Charger (ICBC). - Optimized color touch screen with few keystrokes. - Six user-programmable phases for added flexibility. - Independent Keep Vein Open (KVO) allows more time to focus on patient. - Large 115 mL saline syringe allows for longer KVO and multiple flushes. - Design of low pressure tubing eliminates dead space in the "T" connection that can waste contrast. - The clear barrel design with molded FluidDots help detect the presence of air in a syringe. - Pressure Limit Setting control software enables user to select from one to six preset maximum pressure limits, ranging from 100-300 psi, and to view current pressure during injection next to the pre-selected maximum value on the Solaris display. Installation, applications and one year warranty provided by Medrad. Not for mobile use, refer to Siemens part number M3SSMR300EPM for the Solaris injector used in a mobile environment. This product has been tested and verified for compatibility with the following Siemens' products: MAGNETOM Trio, Espree, Essenza, Verio, Avanto, Symphony, Aera, Skyra and Biograph mMR. Compatibility with other products cannot be guaranteed and use with any other products may void service contracts and/or system warranties.

**1**  **Mapit syngo #Tim**

Based on the T1, T2 or T2* properties of the cartilage syngo ParametricMap allows the early detection of osteoarthritic break down of cartilage structures even before morphological changes occur. The method supports therapeutic decisions in individual patients and can be used to control treatments non-invasively, replacing surgeries or biopsies. The assessment of T1, T2 and T2* properties of tissues in other body regions is also possible. syngo ParametricMap provides very fast 2D and 3D high resolution imaging sequences and the Inline calculation of parametric maps for the T1, T2 and T2* properties of the imaged tissue.

**1**  **Image Fusion syngo**

This application provides a dedicated evaluation software for spatial alignment (matching) and visualization of image data either from different modalities (CT,MR,NM,PET) or from the same modality but from multiple examinations of the same patient. It supports optimal diagnostic outcome (fusion of morphological and functional information) and therapy planning.

**1**  **Hand/Wrist 16 #Ae**

The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility. Hand/Wrist 16 for examinations of the left or right hand and wrist region consists of a base plate and an iPAT compatible 16-channel coil and allows high resolution imaging of the wrist and the hand within one examination. Hand/Wrist 16 will be connected via a SlideConnect plug for fast and easy patient preparation.

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| 1 | **Foot/Ankle 16 #Ae** |
| | The new Tim 4G coil technology with Dual Density Signal Transfer and DirectConnect Technolgy combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility. Foot/Ankle 16 for examinations of the left or right foot and ankle region consists of a base plate and an iPAT compatible 16-channel coil and allows high resolution imaging of the foot and ankle within one examination. Foot/Ankle 16 is a cable-less coil and will be connected via DirectConnect for fast and easy patient preparation. |
| 1 | **One complimentary biomedical tuition is included with the purchase of this system. This training must be completed before the end of the warranty period.** |
| 1 | **Offset Additional Set of Manuals** |
| 1 | **Offset for Initial onsite train 32 hrs** |
| 1 | **Offset Follow-up training 32 hrs** |
| 1 | **Additional Rigging/Out of Scope Inbound** |
| 1 | **Additional Rigging/Out of Scope Outbound** |
| 1 | **projectnumber 2013-573, Avanto,Expires 8/2/2013, Deinstall September / 2014,** |

# Detailed Technical Specifications

## MAGNETOM Aera - USA

| / Product | Description |
|---|---|
| **MAGNETOM Aera - System** | **Aera ex Erlangen ENS_14416900**<br><br>MAGNETOM Aera - the first 1.5T Tim+Dot system - integrates the next generation Tim - Tim 4G and the Siemens unique Dot Engines (Day Optimizing Throughput Engines) enabling workflow efficiency combined with higher diagnostic confidence due to consistent results.<br><br>The system includes:<br><br>**Tim 4G+Dot**<br><br>Tim 4G provides increased patient comfort and optimized workflow efficiency. Only one patient setup, no repositioning, and no changing of coils. Ultra-light-weighted coils with high density of coil elements for maximized patient comfort and increased SNR. Feet-first positioning for almost all examinations possible reduces claustrophobia.<br>Tim 4G is 4G flexibility, accuracy and speed and brings image quality and acquisition speed to a new level.<br><br>Dot helps to take away the complexity in MRI scanning through patient personalization, user guidance and process automation. Optimized scan strategies are provided and can be selected based on patient condition, which allows for high quality exams even when conditions change. Integrated decision points allow the user to easily add or remove one or a group of protocols with one click. Step by step real-time on board guidance guides novice users even through the most complicated exams. Process automation allows optimal timing for breathing, scanning, and planning. Dot can be easily customized to follow the individual standards of care.<br>Dot is personalized, guided and automated and designed to improve workflow efficiency and image consistency. |

| / Product | Description |
|---|---|
| <br><br>**MAGNETOM Aera - System** | MAGNETOM Aera with its 70 cm Open Bore design and a system length of only 145 cm gives a patient friendly appearance that can significantly help patients with anxiety or claustrophobia.<br><br>**Magnet:**<br>- Ultra-short 137 cm long (145 cm with covers), whole-body superconductive 1.5T magnet with active shielding (AS) technology with counter coils<br>- External Interference Shielding (E.I.S.)<br>- Excellent homogeneity enabled by TrueForm magnet design which allows for a cylindrically optimized homogeneity volume resulting in higher image quality (50 × 50 × 45 cm³ DEV, typ. 3.6 ppm based on the 24-plane plot method)<br>- The magnet has a helium capacity of approximately 1,280 liters and a typical Helium boil-off rate of 0 l/yr during typical, undisturbed clinical operation depending on the sequences used and examination time, and provided the system is serviced in regular intervals.<br>- It has an integrated magnet cooling system.<br><br>**Gradient system**:<br>- Actively shielded water-cooled world-class gradient system<br>- True Form Gradient Design<br>- All axes force compensated<br><br>**DirectRF - RF Transmit/Receive System**:<br>- Fully integrated Transmit and Receive path in the magnet housing including extremely compact water-cooled solid state amplifier with 26.1 kW peak power<br>- High dynamic range<br>- Immediate feedback loop for real-time sequence adaptation<br>- Integrated no tune transmit/receive Body Coil<br>- The revolutionary Tim 4G technology allows connecting up to 204 coil elements simultaneously enabling higher SNR and iPAT in all directions. No repositioning of patients is needed even for large Field of View examinations.<br>- Dual-Density Signal Transfer enables ultra-high density coil design by integrating key RF components into the local coil.<br><br>**Tim 4G Coils**:<br>The new Tim 4G coil technology with Dual-Density Signal Transfer, DirectConnect and SlideConnect Technology combines key imaging benefits:<br>Excellent image quality, high patient comfort, and unmatched flexibility.<br><br>The Tim 4G coils are designed for highest image quality combined with easy handling. The high element density of the coils increases SNR and reduces examination times. DirectConnect and SlideConnect™ technology reduce patient set up time significantly. The coils are designed with the patient in mind. Light weighted coils and open design ensure highest patient comfort which results in better patient cooperation and image quality. No coil changing with multi-exam studies saves patient setup- and table time.<br>AutoCoilSelect enables dynamic, automatic, or interactive selection of the coil elements within the Field of View and speeding the exam preparation at the host.<br>All coils are time-saving "no-tune" coils.<br>A comprehensive set of pads for comfortable and stable patient positioning together with safety straps are included.<br><br>- Head/Neck 20<br>The 20-channel coil with its 20 integrated pre-amplifiers ensures excellent signal-to-noise ratio. The unique DirectConnect technology allows users connecting the 20 coil elements of the Head/Neck20 without cables. The patient friendly open design allows for maximum patient comfort which is supported in addition by a look-out mirrow for claustrophobic patients. The high channel coil is iPAT compatible in all directions.<br><br>The open and light design of the upper coil part increases patient comfort and is removable for easy patient handling. The lower coil part may remain on the table for most of the examinations can be used without the upper part .The Head/Neck 20 and Spine 32 are smoothly integrated into the patient table, thus enabling high flexibility in imaging and fewer coil changes and easy handling when switching patients. The Head /Neck 20 |

| / Product | Description |
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| *(Continued)*<br><br>**MAGNETOM Aera - System** | coil is equipped with two removable cushioned head stabilizers for stable and comfortable patient positioning.<br><br>The Head/ Neck 20 can be used for applications like head examinations, neck examinations, MR Angiography, combined head/neck examinations or for imaging of the TMJ (temporomandibular joints).<br><br>Typically combined with the Spine 32 and Body 18 or Peripheral Angio 36 but also other combinations eg with flexible coils like the Flex Large 4 are possible.<br><br>- Body 18<br>The 18-channel coil with its 18 integrated pre-amplifiers ensures maximum signal-to-noise ratio. The 18 coil elements of the Body 18 with only one SlideConnect Plug allows for fast and easy patient preparation resulting in less table time. Fast acquisition times enabled by iPAT in all directions. The light-weighted coil ensures highest patient comfort.<br><br>Body 18 operates in an integrated fashion with the Spine 32 as a 30 channel body coil<br><br>Body 18 can be combined with further Body 18 coils for larger coverage and positioned in different orientations (0°, 90°, 180°, 270°) for patient specific adaptations<br><br>The Body 18 is typically used in combination with the Spine 32 for examinations of the thorax, abdomen, pelvis or hip and operates as a 30 channel body coil (3 rings 10 elements).The Body 18 can also be used for cardiac or vascular applications. Through its perfect combinability with the Spine 32, further Body 18 (optional), the Peripheral Angio 36 (optional), but also the Head/Neck20 and all flexible coils (e.g. Flex Large 4, Flex Small 4) it contributes for a broad range of indications up to whole-body imaging.<br><br>- Spine 32<br>The 32-channel coil with its 32 integrated pre-amplifiers ensures maximum signal-to-noise ratio. The unique DirectConnect technology allows connecting the 32 coil elements of the Spine 32 without the need to plug in any cable. The patient friendly ergonomic design allows for maximum patient comfort. The high element coil is iPAT compatible in all directions.<br><br>Smoothly integrated into the patient table the Spine 32 may remain on the patient table for nearly all exams.<br><br>The Spine 32 is typically combined with Body 18, Head/Neck 20, Peripheral Angio 36 or Flex Large 4, Flex Small 4.<br><br>- Flex Large 4/ Flex Small 4<br>Light-weighted, very flexible, iPAT compatible, 4-element no-tune receiver coils which are made of soft and smooth material. The coils can be wrapped around or used flat.<br><br>Both coils can be connected via Flex Coil interface. One Flex Coil interface is already delivered as standard.<br><br>The coils can be used for different examinations ranging from examinations of the extremities to abdominal examinations.<br><br>**TimTable**<br>- The maximum scan range of the Tim Table is 140 cm. A scan range of 205 cm can be achieved with the Tim Whole Body suite (optional)<br>- The maximum patient weight of 250 kg (550 lbs) is valid for horizontal and vertical movements, which ensures maximized patient comfort for obese patients.<br>- The patient table can be lowered to a minimum height of 52 cm from the floor, for easier patient positioning and better accessibility for geriatric, pediatric or immobile patients. An infusion stand is integrated to ensure fast patient set up also for critical patients.<br>- Multiple Tim4G coils can be connected at once for efficient and patient friendly examinations.<br>- The Tim Table can be moved with two clicks into the isocenter - one click to the upmost position and one click into the isocenter.<br><br>**Dot (Day Optimizing Throughput) Engine**<br>Dot multiplies the power of Tim resulting in greater image consistency and diagnostic confidence<br><br>**Dot Control Centers and Dot Display**<br>- The ergonomically designed Dot Control Centers are integrated left and right into the front covers for |

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| *(Continued)*<br><br>**MAGNETOM Aera - System** | controlling table movement and interaction with the Dot Display. The Dot Control Centers are well illuminated for easy visual recognition.<br><br>- Automated table move up to upmost position, to center position or Home position facilitate smooth patient preparation and will reduce table time<br>- Variable (6 levels) ventilation and lighting inside the magnet bore or volume adjustments are possible for increased patient comfort<br>- The Dot Display provides on board guidance for patient set up where it's needed - directly at the scanner. Information such as Patient name or exam type or required patient position, guidance for ECG set up and immediate visualization of physiological curves will be provided for convenient operation.<br>- Almost all table control functions, including ventilation and illumination of the magnet bore, can be also controlled from the operator console for convenient operation.<br><br>**Dot Technology**<br>Dot makes it easy to get the best possible results for virtually any type of patient. Dot gives uniquely tailored, optimized scans configurable to patient condition or clinical question.<br>Dot provides patient personalization, user guidance and process automation and is of course configurable by the user to adapt to the different clinical needs and standards of care.<br><br>**Brain Dot Engine**<br>The Brain Dot Engine simplifies general brain examinations with guided and automated workflows customized to the site specific standards of care. The Brain Dot Engine supports the user in achieving reproducible image quality with increased ease of use and time efficient exams.<br>The brain workflow can be personalized to the individual patient condition and clinical need. Several predefined strategies are included, which can be easily selected with one click. They can be changed at any time during the brain workflow.<br><br>Protocols tailored for use of contrast media are integrated.<br>- Standard: Standard examination with 2D protocols<br>- Resolution focus: Examination with 3D protocols (with e.g. SPACE) for detailed views<br>- Speed focus: Examination with fast 2D protocols (with e.g. HASTE) for further speeding up the exam<br>- Limited patient capabilities: Examination with *syngo* BLADE protocols<br>- to minimize and correct for the effects of motion automatically<br><br>Step-by-step user guidance is seamlessly integrated. Example images and guidance text are displayed for each individual step of the scanning workflow. Both - images and text - are easily configurable by the user.<br><br>Easy positioning of the patient with AutoPosition. The patient is automatically placed at the isocenter without any laser marking required.<br><br>AutoAlign Head allows automatically slice positioning and aligns on the anatomically derived sagittal, coronal, and axial slices of the localizer. The operator-free alignment and anatomical marking are consistent, independently of patient age, head position, or disease.<br><br>Automatic real-time calculation of trace-weighted images and ADC maps with Inline DiffusionTechnology.<br><br>Easy rerun or repeat with functionality allows for reduced table time even in case of patients with pain or claustrophobia. An image inside the examination UI can be selected and a rerun of the corresponding series can be triggered with identical sequences or parameters. Alternatively an exam can be repeated with a changed strategy.<br><br>The Brain Dot Engine as all Dot Engines can be modified by the user to their individual standard of care.<br><br>**Tim Application Suite**<br>The Tim Application Suite offers a complete range of clinically optimized sequences, protocols and workflow functionalities for all body regions. Excellent head-to-toe imaging can be accomplished with the sequences and features included in this application suite. To enable this comprehensive application range, nine dedicated application packages have been included.<br><br>- Neuro Suite<br>- Angio Suite<br>- Cardiac Suite |

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| *(Continued)*<br><br>**MAGNETOM Aera - System** | - Body Suite<br>- Onco Suite<br>- Breast Suite<br>- Ortho Suite<br>- Pediatric Suite<br>- Scientific Suite<br><br>**Neuro Suite**<br>Comprehensive head and spine examinations can be performed with dedicated programs. High resolution protocols and fast protocols for uncooperative patients are provided. The Neuro Suite also includes protocols for diffusion imaging, perfusion imaging, and fMRI. It includes for example:<br>- EPI sequences and protocols for diffusion, perfusion and fMRI for advanced neurological applications. Diffusion weighted imaging is possible with up to 16 b-values in the orthogonal directions. Dynamic Analysis software (included in standard configuation) enables calculation of:<br>  - ADC maps<br>  - t-test maps from the EPI images for fMRI<br>  - Time-to-Peak maps for perfusion analysis.<br>- Whole spine protocols acquire in multiple steps via software controlled table movement in a single click.<br>- 3D isotropic resolution volume imaging using T1 3D MPRAGE / 3D FLASH, SPACE DarkFluid, T2 SPACE and 3D TSE<br>- T2-weighted high resolution 3D Restore protocols optimized for inner ear examinations<br>- Whole-spine protocols in multiple steps with software controlled table movement<br>- 2D and 3D MEDIC protocols for T2-weighted imaging, particularly for C-spine examinations in axial orientation where reproducibility is difficult due to CSF pulsations and blood flow artifacts<br>- 3D Myelograms with 3D HASTE and 3D True-FISP for anatomical details<br>- Dynamic sacro-iliac joint imaging after contrast administration using a fast T1-weighted FLASH 2D sequence<br>- Spine diffusion protocols to differentiate osteoporosis versus tumor infiltration and post-radiotherapy changes versus residual tumor with PSIF sequence<br>- Precision filter for high spatial accuracy e.g. for neuro intra-operative imaging and stereotactic planning<br>- 3D CISS (Constructive Interference in Steady State) for excellent visualization of fine structures such as cranial nerves. High resolution imaging of inner ear and spine<br>- AutoAlign Head LS providing a fast, easy, standardized, and reproducible patient scanning supporting reading by delivering a higher and more standardized image quality<br><br>**Angio Suite**<br>Excellent MR Angiography can be performed to visualize arteries and veins with or without contrast agent.<br>*Contrast-enhanced MRA*<br>- 3D contrast-enhanced MRA protocols for e.g. single step, dynamic, peripheral, whole body MRA with the shortest TR and TE. The strong gradients make it possible to separate the arterial phase from the venous phase.<br>- TestBolus workflow for optimized bolus timing and superb image quality.<br>- CareBolus functionality for accurate determination of the bolus arrival time and the "Stop and Continue" of the 3D ce-MRA protocol after the 2D bolus control scan.<br>- Dynamic ce-MRA for 3D imaging over time.<br>*Non-contrast-MRA and venography*<br>- 2D and 3D Time-of-Flight (ToF) protocols for MRA for the Circle of Willis, carotids, neck vessels, and breath-hold protocols for abdominal vessels<br>- Triggered 2D ToF sequences for non-contrast MRA, particularly of the abdomen and the extremities<br>- 2D/3D Phase-Contrast<br>- MR venography with 2D/3D Time-of-Flight (ToF) and Phase-Contrast<br>- TONE (Tilted Optimized Non-saturation Excitation) and MTC (Magnetization Transfer Contrast) techniques for improved Contrast-to-Noise Ratio (CNR)<br>*Image processing tools*<br>- MPR, MIP, MinIP, and 3D SSD |

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| **(Continued)**<br><br>**MAGNETOM Aera - System** | - Inline MIP for immediate results<br>- Inline subtraction of pre- and post-contrast measurements<br>- Inline standard deviation maps of Phase-Contrast measurements for delineation of arteries and veins<br><br>**Cardiac Suite**<br>The cardiac suite covers comprehensive 2D routine cardiac applications, ranging from morphology and ventricular function to tissue characterization. Featuring *syngo* BEAT 2D in conjunction with iPAT and T-PAT techniques.<br>*Cardiac views*<br>- Fast acquisition of the basic cardiac orientations for further examination planning<br>- Cardiac scouting provides users with a step-by-step procedure for the visualization and planning of typical cardiac views, e.g. based on TrueFISP or Dark Blood TurboFLASH: short axis, 4-chamber and 2-chamber views.<br>*syngo BEAT*<br>- Unique tool for fast and easy cardiovascular MR imaging<br>- E.g. 1 click change from FLASH to TrueFISP for easy contrast optimization<br>- 1-click to switch arrhythmia rejection on / off<br>- 1-click change from Cartesian to radial sampling to increase effective image resolution (e.g. in pediatric patients) and avoid folding artifacts in large patients<br>*Visualization of structural cardiovascular pathologies with CMR - syngo BEAT*<br>- Breath-hold and free breathing techniques for strong contrast between the blood and vascular structures. Dark Blood TSE and HASTE imaging are available for the structural evaluation of the cardiothoracic anatomy, including vessels or heart valves. Cine techniques (FLASH & TrueFISP) for high-resolution valve evaluation<br>- Multiple contrasts such as T1- and T2-weighted imaging for use in diseases such as myocarditis (inflammation / hyperaemia), ARVD (fibrous-fatty degeneration) or acute myocardial infarction (edema)<br>- Dark-blood TSE with motion compensation for high-quality vessel wall imaging in small or large vessels<br>*Tools for rapid evaluation of left or right ventricular function*<br>- Acquisition of a stack of short-axis slices (standard segmented FLASH, or advanced segmented TrueFISP)<br>- Automatic adjustment of the acquisition window to the current heart rate<br>- Use of the Inline ECG for graphical ECG triggering setup<br>- Retrospective gating with cine sequences (TrueFISP, FLASH)<br>- Protocols for whole-heart coverage<br>- iPAT integration for highest temporal and spatial resolution<br>- Real-time imaging in case the patient is not able to hold his breath<br>*Dynamic imaging and tissue characterization with syngo BEAT*<br>- Protocols for high-contrast and high-resolution tissue characterization<br>- Protocols for stress and rest imaging with TrueFISP or TurboFLASH contrast support the acquisition of multiple slices with high resolution and arbitrarily adjustable slice orientation for each slice<br>- T-PAT with mSENSE and GRAPPA for advanced parallel imaging provides fast high-resolution dynamic imaging<br>- Segmented IR TrueFISP / FLASH with TI scout for optimization of tissue contrast<br>- Advanced tissue characterization with 2D phase-sensitive IR (PSIR) sequences TrueFISP and FLASH contrast. Magnitude and phase-sensitive images with one acquisition<br>- Simple: no adjustment of inversion time (TI) necessary with PSIR technique<br>- Ungated single-shot PSIR imaging for tissue characterization under difficult conditions: free-breathing technique that can be applied even in case of arrhythmia<br><br>Physiological Measurement Unit (PMU) - Wireless Physio Control<br>- Synchronizes the measurement with the physiological cycles (triggering to minimize motion artifacts caused by cardiac and respiratory movements)<br>- Wireless Sensors<br>- Wireless Vector ECG / respiration and pulse sensors for physiologically synchronized imaging, rechargeable battery-powered - for optimized patient handling<br>- Physiological Signals Display<br>- ECG (3 channels)<br>- Pulse |

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| *(Continued)*<br><br>**MAGNETOM Aera - System** | - Respiration<br>- External Trigger Input Display<br><br>ECG Triggering:<br>- Acquisition of multiple slices, e.g. of the heart, at different phases of the cardiac cycle<br>- Excellent image quality by synchronizing data acquisition with cardiac motion<br>- Peripheral Pulse Triggering:<br>- Reduces flow artifacts caused by pulsatile blood flow<br>- Excellent image quality by synchronizing data acquisition to the pulsatile blood flow<br>- Respiratory Triggering:<br>- Excellent image quality by synchronizing data acquisition with the respiratory motion<br>- External Triggering:<br>- Interface for trigger input from external sources (e.g. Patient Monitoring System) inside the examination room<br>- Interface for trigger input from external sources (e.g. pulse generator, trigger sources for fMRI) outside the examination room<br>- Optical trigger output for fMRI<br>- Retrospective gating for ECG, peripheral pulse, and external trigger input<br><br>**Breast Suite**<br>MR imaging has proven a very high sensitivity for breast lesions and is the gold standard for the examination of silicone implants. Extremely high spatial and temporal resolution can be achieved in very short measuring times by using iPAT with GRAPPA.<br>Excellent soft tissue differentiation, customized protocols (e.g. with fat saturation or water excitation or silicone excitation), as well as flexible multiplanar visualization allow for fast, simple and reproducible evaluation of MR breast examinations.<br>This package includes:<br>- Quantitative evaluation and fast analysis of the data with colorized Wash-in, Wash-out, Time-To-Peak, Positive-Enhancement-Integral, MIPtime and combination maps with Inline technology or for offline calculation<br>- High-resolution 2D protocols for morphology evaluation<br>- High-resolution 3D protocols covering both breasts simultaneously<br>- Protocols to support interventions (fine needle and vacuum biopsies, wire localization)<br>- Protocols for evaluating breasts with silicone implants<br>- Automatic and manual frequency adjustment, taking into account the silicone signal<br>- Detection of the silicone signal either to suppress the silicone signal, if the surrounding tissue is to be evaluated, or to suppress the tissue signal in order to detect an implant leakage<br>- SPAIR - robust fat sat (robust fat suppression using an adiabatic frequency selective inversion pulse)<br>- DIXON - 2-point Dixon with 3D VIBE, the following contrasts can be obtained: in-phase, opposed phase, fat and water image.<br>- iPAT with GRAPPA for maximum resolution in short time<br>- Inline subtraction and MIP display<br>- Offline subtraction, MPR and MIP display<br>- *syngo* REVEAL: diffusion imaging for breast exams<br>- iPAT Extension allows bilateral 3D sagittal breast imaging with Fat Sat or Water excitation<br><br>The Breast Suite also includes:<br>***syngo* VIEWS (Volume Imaging with Enhanced Water Signal)**<br>- bilateral - both breasts are examined simultaneously<br>- axial - the milk ducts are directly displayed<br>- fat-saturated or water-excited - fat complicates clinical evaluation and is suppressed<br>- near-isotropic 3D measurement - the same voxel size in all three directions for reconstruction in any slice direction<br>- submillimeter voxel - highest resolution for precise evaluation |

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| *(Continued)*<br><br>**MAGNETOM Aera - System** | **Body Suite**<br>Body Suite covers your needs for clinical body applications. Ultrafast high resolution 2D and 3D protocols are provided for abdomen, pelvis, MR Colonography, MRCP, dynamic kidney, and MR Urography applications. Siemens unique 2D PACE technique makes body imaging easy allowing for multi-breath hold examinations as well as free breathing during the scans. Motion artifacts are greatly reduced with 2D PACE Inline technology.<br>This package includes:<br><br>- Free breathing 2D PACE applications with 2D/3D HASTE (RESTORE) and 2D/3D TSE (RESTORE)<br>- Optimized fast single shot HASTE protocols and high-resolution 3D RESTORE protocols based on SPACE and TSE for MRCP and MR Urography examinations<br><br>*ABDOMEN:*<br>*2D:*<br>- T1w (FLASH) breath-hold scans +/- Fat Sat (SPAIR, Q-FatSat, in-/opp-phase)<br>- T2w (HASTE, TSE/BLADE, EPI ) breath-hold scans +/- Fat Sat (SPAIR, FatSat, STIR)<br>- T1w (TFL) triggered  scans (2D PACE free breathing) in-/opp-phase<br>- T2w (HASTE, TSE/BLADE, EPI) triggered  scans (2D PACE free breathing) +/- Fat Sat (SPAIR,FatSat, STIR) as well as HASTE- and TSE-multi-echo<br>- Optimized fast single shot HASTE protocols and high-resolution 3D RESTORE protocols based on SPACE and TSE for MRCP and MR urography examinations<br><br>*3D:*<br>- Dixon (VIBE 2pt-Dixon) breath-hold scans, following contrasts can be obtained: in-phase, opposed phase, fat and water image.<br>- Dynamic (VIBE + Q-FatSat) protocols for best visualization of focal lesions with high spatial and temporal resolution<br>- Colonography bright lumen with T2-weighted TrueFISP and dark lumen with T1-weighted VIBE<br><br>*PELVIS:*<br>- High-resolution T1w, T2w pelvic imaging (prostate, cervix)<br>- Isotropic T2w SPACE 3D protocols for tumor search in the pelvis<br>- Dynamic volume examinations with 3D VIBE<br>- *syngo* REVEAL: diffusion imaging for liver and whole body exams<br><br>**Onco Suite**<br>MR imaging has an excellent advantage of soft tissue contrast, multi-planar capabilities and the possibility of selectively suppressing specific tissue e.g. fat or water. This helps visualize pathologies, particularly metastases. The Onco Suite features a collection of sequences as well as protocols and evaluation tools that guide through a detailed screening of clinical indications, such as in hepatic neoplasms.<br>This package includes:<br><br>- STIR TSE and HASTE, FLASH in-phase and opposed-phase protocols with a high sensitivity to metastases visualization<br>- Dynamic imaging protocols for assessment of the kinetic behavior for lesion visualization and characterization<br>- Quantitative evaluation and fast analysis of the data with colorized Wash-in, Wash-out, Time-To-Peak, Positive-Enhancement-Integral, MIPtime and combination maps with Inline technology or for offline calculation<br>- Display and analysis of the temporal behavior in selected regions of interest with the included MeanCurve post-processing application. This includes the capability of using additional datasets as a guide for defining regions of interest even faster and easier than before.<br>- *syngo* REVEAL: diffusion imaging for liver and whole body exams<br><br>Dedicated prostate protocols for detection, localization, and staging of tumors and recurrences<br>- *syngo* REVEAL (diffusion-weighted imaging)<br>- Protocols with high temporal resolution allow time course evaluation based on pharmacokinetic modeling<br><br>**OrthoSuite**<br>Ortho Suite is a comprehensive collection of protocols for joint and spine imaging. MR imaging is especially suitable for avascular necrosis and internal derangements. The protocols included in this Suite can also be applied for imaging of tumors and infections.<br><br>This package includes: |

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| **(Continued)**<br><br>**MAGNETOM Aera - System** | - 2D TSE protocols for PD, T1 and T2-weighted contrast with high in-plane resolution and thin slices<br>- 3D MEDIC, 3D TrueFISP protocols with water excitation for T2-weighted imaging with high in-plane resolution and thin slices<br>- High resolution 3D VIBE protocol for MR arthrography (knee, shoulder and hip)<br>- 3D MEDIC, 3D TrueFISP, 3D VIBE protocols with water excitation having high isotropic resolution, optimized for 3D post-processing<br>- PD SPACE with fat saturation and T2 SPACE with high isotropic resolution optimized for 3D post-processing<br>- Whole spine single-step or multi-step protocols<br>- Excellent fat suppression in off-center positions, e.g. in the shoulder due to high magnet homogeneity<br>- Dynamic TMJ and ilio-sacral joint protocol<br>- Susceptibility-insensitive protocols for imaging in the presence of a prosthesis<br>- Multi-Echo SE sequence with up to 32 echoes for the calculation of T2 time maps (calculation included in the Scientific Suite)<br>- High resolution 3D DESS (Double Echo Steady State): T2 / T1-weighted imaging for excellent fluid-cartilage differentiation<br><br>**Pediatric Suite**<br>The parameters for pediatric imaging vary significantly in comparison to the parameters for adults. The reasons are developing tissues, body size, faster heart rates and restricted compliance with breath-hold commands. Protocols can be adapted for imaging infants.<br><br>**Scientific Suite**<br>Scientific Suite supports the scientifically oriented user with an easy access to application-specific data for further processing and advanced image computation methods.<br>- Support of USB memory sticks<br>- Access to the file system by means of a secure and convenient browser<br>- Anonymization of patient data<br>- Easy generation of AVIs and screenshots for integration into presentations and training videos<br>- Export function for tables, statistics and signal-time-courses in a communal format (MeanCurve, Spectroscopy, DTI evaluation)<br>- Advanced image computation methods such as T2 and T1 time calculation, addition, subtraction, multiplication, division, and integration of images<br><br>The sequences, features and techniques for acquisition and reconstruction included in the Tim Application Suite are described in detail below.<br><br>**Sequences**<br>Spin Echo family of sequences:<br>- Spin Echo (SE) - Single, Double, and Multi Echo (up to 32 echoes); Inversion Recovery (IR)<br>- 2D / 3D Turbo Spin Echo (TSE) - Restore technique for shorter TR times while maintaining excellent T2 contrast; TurboIR: Inversion Recovery for STIR, DarkFluid T1 and T2, TrueIR; Echo Sharing for dual-contrast TSE<br>- 2D / 3D HASTE (Half-Fourier Acquisition with Single Shot Turbo Spin Echo) - Inversion Recovery for STIR and DarkFluid contrast<br>- SPACE for 3D imaging with high isotropic resolution with T1, T2, PD, and DarkFluid Contrast<br><br>Gradient Echo family of sequences:<br>- 2D / 3D FLASH (spoiled GRE) - dual echo for in- / opposed phase imaging 3D VIBE (Volume Interpolated Breathhold Examination) - quick fat saturation; double echo for in-phase / opposed phase 3D imaging; DynaVIBE: Inline 3D elastic motion correction for multi phase data sets of the abdomen; Inline Breast Evaluation<br>- 2D / 3D MEDIC (Multi Echo Data Image Combination) for high resolution T2 weighted orthopedic imaging and excellent contrast<br>- 2D / 3D TurboFLASH - 3D MPRAGE; single shot T1 weighted imaging e.g. for abdominal imaging during free breathing<br>- 3D GRE for fi eld mapping<br>- 2D / 3D FISP (Fast Imaging with Steady State Precession) |

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| *(Continued)*<br><br>**MAGNETOM Aera - System** | - 2D / 3D PSIF - PSIF Diffusion<br>- Echo Planar Imaging (EPI) - diffusion-weighted; single shot SE and FID e.g. for BOLD imaging and Perfusion-weighted imaging; 2D / 3D Segmented EPI (SE and FID)<br>- ce-MRA sequence with Inline subtraction and Inline MIP<br>- 2D / 3D Time-of-Flight (ToF) Angiography - single slab and multi slab; triggered and segmented<br>- 2D / 3D Phase Contrast Angiography<br>- *syngo* BEAT Tool - TrueFISP segmented; 2D FLASH segmented;<br>- Magnetization-prepared TrueFISP (IR, SR, FS); IR TI scout; Retrogating<br><br>Standard Fat/Water Imaging<br>- Fat and Water Saturation. Additional frequency selective RF pulses used to suppress bright signal from fatty tissue. Two selectable modes: weak, strong<br>- Quick FatSat<br>- SPAIR: robust fat suppression for body imaging using a frequency selective inversion pulse<br>- Fat / Water Excitation. Spectral selective RF pulses for exclusive fat / water excitation<br>- Dixon technique for fat and water separation -   based on VIBE (2 point Dixon)<br>Standard Techniques<br>- True Inversion Recovery to obtain strong T1-weighted contrast<br>- Dark Blood inversion recovery technique that nulls fl uid blood signal<br>- Saturation Recovery for 2D TurboFLASH, gradient echo, and T1-weighted 3D TurboFLASH with short scan time (e.g. MPRAGE)<br>- Freely adjustable receiver bandwidth, permitting studies with increased signal-to-noise ratio<br>- Freely adjustable flip angle. Optimized RF pulses for image contrast enhancement and increased signal-to-noise ratio<br>- MTC (Magnetization Transfer Contrast). Off-resonance RF pulses to suppress signal from certain tissues, thus enhancing the contrast. Used e.g. in MRA<br>- Argus viewer for reviewing cine studies•<br>- Report Viewer for DICOM structured reports including report editing<br>- Dynamic Analysis for addition, subtraction, division, standard deviation, calculations of ADC maps, T1 and T2 values, TTP, t-Test, etc.<br>- Image Filter<br>- 3D post-processing MPR, MIP, MinIP, SSD<br>- Flexible film formats and paper print<br>- Data storage of images and cine AVI fi les on CD / DVD with DICOM viewer as the viewing tool for hand out to the patients or referrals<br>- Selectable centric elliptical phase reordering via the user interface<br>- Multiple Direction Diffusion Weighting (MDDW) - perform diffusion tensor imaging with multiple diffusion weightings and up to 12 directions for generating data sets.<br>- Inversion Recovery to nullify the signal of fat, fluid or any other tissue<br><br><br>Standard techniques for Flow Artifact reductions<br>- LOTA (LongTerm Data Averaging) technique to reduce motion and flow artifacts<br>- Pre-saturation techniques using RF saturation pulses to suppress flow and motion artifacts<br>- Tracking SAT bands maintain constant saturation of venous and/or arterial blood flow e.g. for 2D/3D sequential MRA<br>- TONE (Tilted Optimized Non-saturating Excitation - variable excitation flip angel to compensate inflow saturation effects in 3D MRA - selectable on desired flow direction and speed<br>- Gradient Motion rephasing permitting effective reduction of flow artifacts<br><br>Standard Motion Correction<br>- *syngo* Blade - improves image quality by minimizing and correcting for the effects of motion during an MR sequence acquisition. e.g. head, spine, orthopedic imaging and the abdomen |

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| *(Continued)* <br><br> **MAGNETOM Aera - System** | - 1D PACE (Prospective Acquisiton CorrEction) allows examination of patients with free breathing <br> - 2D PACE (Precise Motion Correction) detects and corrects respiratory motion eg of the heart or liver <br><br> MAGNETOM Aera runs *syngo* MR software. *syngo*® is the unique software platform for medical applications. Parallel working and one-click exams are efficiently supported and increase productivity. Parallel scanning and reconstruction are standard. <br> The unique Phoenix technique is the easiest way to exchange protocol data. It supports intelligent extraction of sequence parameters from images acquired on a MAGNETOM Aera system. <br> Inline technologies, scan@center or AutoVoiceCommands speed up the workflow further. <br> The context-sensitive "Online Help" function and *syngo* Scan Assistant offer support and propose solutions to MR-specific questions and parameter conflicts. <br><br> Studies can be easily networked and managed using the standard DICOM 3.0 protocol for efficient support of workflow. The following standard functions are supported: Send/Receive, Query/Retrieve, and Basic Print for DICOM-compatible laser cameras (camera is not included in the basic unit), DICOM Worklist, DICOM Storage Commitment (SC) DICOM Modality Perform Procedure Step (MPPS), DICOM Structured Report (SR), DICOM Study Split. <br><br> **Patient Communication** <br> - The intercom system includes an ergonomically designed patient communication unit for desktop positioning on the *syngo* Acquisition Workplace and pneumatic headphones for the patient. <br> - Active Noise Cancellation allows for increased user comfort in the control room combined with comprehensive patient supervision. <br> - It controls emergency table stop, volume control of speaker and headphones in the examination room, volume control of speaker in the control room, response to the patient's activation of the assistance-call button and provides a connection to an external audio system (external audio system is not included in the basic unit) for music playback. <br><br> **Computer system** <br> The high performance host computer and the new high performance measurement and reconstruction system are ideally suited for even the most demanding applications. The PC-based computer system uses the intuitive *syngo* MR user interface. The computer system includes the following components: <br> High-performance measurement and reconstruction system <br> - Two Intel Quadcore Processor ≥ E 5540 <br> - clock rate of ≥ 2 × 2.53 GHz <br> - Main memory (RAM) of 48 GB, <br> - Hard disk for raw data ≥ 300 GB <br> - Hard disk for system software ≥ 100 GB <br> - Parallel Scanning and Reconstruction of up to 8 data sets <br> - Reconstruction speed <br>     - 12.195 recons per second (256 x 256 FFT, full FoV) <br>     - 37.914 recons per second (256 x 256 FFT, 25 % recFoV) <br><br> High-performance host computer <br> - Intel Xeon processor ≥ W3520 QuadCore <br> - clock rate ≥ 2.66 GHz <br> - Main Memory (RAM) ≥ 4 GB <br> - three hard disks <br>     - system SW ≥ 146 GB SAS <br>     - data base ≥ 146 GB SAS <br>     - images ≥ 146 GB SAS <br> - DVD-R writer for CD-R (approx. 4000 images $256^2$ DICOM Standard, ISO 9660 ) and DVD-R (approx. 25 000 images $256^2$ DICOM Standard, ISO 9660) storage of DICOM data or other data like AVI files <br>     - DVD-ROM drive <br>     - Electronic mouse. <br><br> - The combination of host computer and the measurement and reconstruction system offers a truly powerful |

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| **(Continued)**<br><br>**MAGNETOM Aera - System** | imaging system designed for large image matrix sizes of up to 1024 x 1024. The unrestricted multitasking capability allows time-saving parallel scanning and reconstruction.<br>- High-resolution 19" color LCD flat screen monitor with 1280 x 1024 pixel display, integrated gamma correction for optimum display of radiographic grayscale images and automatic backlight control for long term brightness stability.<br><br>**Installation**:<br>- The relatively lightweight design of the MAGNETOM Aera in most cases eliminates the need for structural building reinforcements and thus facilitates installation in upper floors.<br>- The compact integrated design allows for short installation times and reduces the required space to less than 30 sqm (323 sq. ft.) for the entire installation. The minimum room height clearance is only 2.40 m (7' 10").<br>- MAGNETOM Aera allows siting of the system without a dedicated computer room - no additional cooling or floor requirements.<br>- MAGNETOM Aera combines state-of-the-art performance with peace of mind. High system availability is ensured by the expert, highly trained Siemens MR service engineers;<br>- Your Siemens service contract (not included in the basic unit) offers a comprehensive range of benefits such as Uptime Remote Diagnostics for improved productivity and maximum uptime. |
| **Tim [204x48] XQ Gradients #Ae** | **Tim [204x48] performance level**<br>Tim 4G offers DirectRF a completely redesigned RF architecture. This new all digital-in/ digital-out design integrates all RF transmit and receive components at the magnet, eliminating analog cables for true signal purity. This compact and efficient design enables a dynamic feedback control for temporal stability and power linearity. The all-new innovative coil architecture packs more coil elements in a smaller space. Therefore up to 204 coil elements can be simultaneously connected. The newly designed ultra high density array is an essential part supplementing Tim4G. Combined with the 48 independent RF channels advanced iPAT capabilities and SNR are enabled.<br>An additional benefit of multiple coil elements and receiver channels is improved performance in multi-directional, i.e. three dimensional, high-speed, high-resolution iPAT in the head-feet, anterior-posterior or left-right directions.<br><br>This option includes also Advanced High Order Shim.<br><br>**XQ gradients**<br>Siemens XQ gradients provide actively shielded, water cooled world-class gradients. All axes are force-compensated.<br><br>The XQ gradients have:<br>- Maximum gradient amplitude of 45 mT/m, per axis, i.e. 78 mT/m vector summation gradient performance,<br>- max. slew rate 200 T/m/s per axis, i.e. 346 T/m/s vector summation,<br>- minimal rise time 225 µs, from 0 to 45 mT/m amplitude<br>- Max. output voltage for each of the gradient axes 2250 V<br>- Max. output current for each of the gradient axes 900 A<br>- Separate cooling channels that simultaneously cool primary and secondary coils allow the application of extremely gradient intensive techniques in a new class of performance.<br>- 100% duty cycle for fast and demanding techniques such as ultra-short TE MRA in continuous operation, thin slice single breath-hold liver studies and EPI imaging techniques (all optional in appropriate clinical packages).<br>- Variable Field-of-View selection from 0.5 cm to 50 cm (up to 45 cm in z direction) for optimal coverage and highest spatial resolution in diagnostic. The minimum slice thickness in 2D and 3D is 0.1 mm and 0.05 mm, respectively.<br>- Acquisition of sagittal, transverse, coronal, single oblique and double oblique slices with highest resolution.<br>- The extremely compact water-cooled gradient amplifier features a modular expandable design with excellent linearity and pulse reproducibility. It is digitally controlled and has very low switching losses due to ultrafast solid state technology. |
| **PC Keyboard US english #Tim** | The keys of the numerical key panel are assigned to syngo-specific functions and labeled with the corresponding syngo icons. The keyboard supports the country specific special characters. |

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| **Pure White Design #T+D** | The unique color and material selection enhances the visual appeal of the new system design, thereby creating an enticing, patient-friendly impression.<br>The Dot Control Centers and the unique Dot Display are neatly integrated into this main face plate. The aesthetically pleasing and ergonimcally designed control elements of the Dot Control Centers are well illuminated for easy visual recognition.<br>In particular, the table cover and the asymmetric left deco area cover have also been designed to promote a modern visual appearance. This combination of ingenuity and practical design as presented with "Pure White" design with its brilliant white and the silver trim simply makes the MAGNETOM an overall visually appealing system and creates a patient-friendly environment. |
| **Tim Dockable Table #Ae** | The new MAGNETOM Aera table with its light appealing design allows for a fast patient preparation and maximized patient comfort.<br>It provides unobstructed foot space for attending staff and direct access to the patient. The patient table can be lowered to a minimum height of 56 cm (18.5") from the floor, for easier moving of immobile patients and better access for geriatric, pediatric patients or immobile patients. The Tim Table can be moved with two clicks into the isocenter - one click to the upmost position and one click into the isocenter. The tabletop travels beyond the rear end of the system, enabling additional patient access.<br><br>Multiple Tim4G coils can be connected at once for efficient patient set up and patient friendly examinations. The seamless integration of multiple Tim4G coils is possible via 4 SlideConnect and 4 DirectConnect connector slots, which are embedded in the table. This allows for comprehensive examinations without the need of repositioning.<br><br>The Tim Dockable Table is easily adjustable for height even in the undocked state. A minimum height of 61 cm allows for easy wheelchair access or easy patient movement to the hospital bed.<br>The integrated infusion stand and arm rests allow for fast patient set up anywhere and also for critical patients |
| **syngo.via Advanced User #1** | **Brief description**<br>*syngo.*via provides one graphical user interface to prepare and read images from various modalities.<br>Supported images types are:<br>- Computed Tomography Images<br>- Magnetic Resonance Images<br>- PET Images<br>- Computed Radiography Images<br>- Digital X-Ray Images<br>- X-Ray Angiographic Images<br>- X-Ray Radio-Fluoroscopic Images<br>- Ultrasound 2D Images<br>- Secondary Capture Images<br>- Encapsulated PDFs<br><br>**Standard reading functions, such as:**<br>- Browser functionality for fast patient and data access<br>- Case navigator for easy and fast case navigation<br>- Automatic image Processing,<br>- Automatic Loading and displaying of images in user-specific layouts, Multiple layouts for 2D, 3D diagnosis<br>- Ad Hoc workflow change for flexible Application handling<br>- Scrolling through images (e.g. movie mode, fast mouse scrolling, synchronized scrolling)<br>- Mirror, rotate, invert, windowing, pan/zoom, annotations, distance and angle measurement, pixel lens, ROI / VOI evaluation<br>- Findings navigator - create, collect ,navigate and present findings quickly<br>- Correlated cursor<br>- Series synchronization for pan/zoom, windowing, LUT, scrolling<br>- Locked navigation of different modality types (e.g. MR / CT)<br>- User-defined context menu<br>- Snapshot images as secondary capture |

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| *(Continued)*<br><br>**syngo.via Advanced User #1** | **Integrated 3D tools, such as:**<br>- All reformats immediately available: VRT, MIP, MIP thin, MinIP, MPR thin / thick, interactive slice thickness change<br>- VRT Punch, VRT Gallery<br>- Clip plane and clip box<br>- Bone and Table removal for fast segmentation<br>- MPR/MPR Fusion and registration<br>- Parallel and radial range<br>- 2D & 3D reference lines, 3D Reference Point<br>- Movie export<br><br>**Applications for dedicated clinical areas**<br>Beside standard 2D/3D capabilities, the following advanced functionalities for dedicated clinical areas are part of *syngo*.via.<br>These applications are medical products in their own rights and necessary country-specific approvals might not yet be available (e.g. 510k, CE Mark).<br><br>syngo CT Coronary<br>Review Marker, Heart Isolation, Movie (Beating Heart), • Plaque Visualization, Manual Coronary Tracking (> 2 click centerline), Cardiac Planes, Curved & Cross-Section MPR, Context-specific Reporting<br><br>CT Vascular<br>Review Marker, Manual Vessel Tracking (> 2 click centerline), Curved & Cross Sectional MPR, Integrated Reporting Plaque Visualization,<br>- Context-specific Reporting<br><br>PET&CT Oncology<br>- Navigation between segments,  Timepoint comparison (two timepoints),<br>- Image fusion and Registration, RECIST/WHO measurement, • PET and MR visualization, Basic PET evaluation, Image fusion, Registration, 3D overview image,<br>- Context-specific reporting<br><br>*syngo.CT* Dual Energy<br>The *syngo.CT* Dual Energy offers a viewer that displays a fused image for initial diagnosis. It includes Optimum Contrast to calculate automatically contrast-optimized images as well as the possibility to calculate monoenergetic images for a range of 40 - 190 keV. The additional, optional Dual Energy applications utilize *syngo* Dual Energy's two data sets even further: the material-specific difference in attenuation enables an easy classification of the elementary chemical composition of the scanned tissue. Works only with Dual Energy images from SOMATOM Definition and Definition Flash.<br><br>MR Reading<br>- MR Reading workflow<br>- Follow-up support: Follow-up layout for easy comparison between two timepoints.<br>- Rescan handling: Repeated scans are collected in one stack that provides an overview layout to select the best rescan for reading.<br>- Workflow customization and creation: MR Reading allows the user to generate new, customized workflows.<br>- Context-specific Reporting<br><br>**Workflow Automation**<br>- Triggered by PACS or modality:<br>  Disease-specific workflow mapping can also be done based on image information (modality and/or study description)<br>- Triggered by RIS:<br>  *syngo*.via requests the DICOM Modality Worklist (DMWL) from the connected RIS to enable automatic disease-specific workflow mapping and prefetching of examinations from PACS for follow-up reading.<br><br>**Context-specific reporting:** |

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| *(Continued)*<br><br>**syngo.via Advanced User #1** | - Context-specific reports can be derived from different clinical applications (structured reporting).<br>- Findings collected in the Findings Navigator can be transferred to context-specific reporting application and can then be stored as DICOM Structured Reports.<br>- The reports created with *syngo.*via are stored as encapsulated PDF DICOM objects. Additionally the report can be saved in the file system as a PDF file. The stored PDF report can be viewed and printed by the clinical user.<br>- With RIS integration package and an additional license, the report content can be transferred to the RIS via HL7.<br><br>**Further functionality, such as:**<br>- "Direct Image Transfer" for Siemens modality integration<br>- *syngo* Expert-i support for *syngo* MMWP integration<br>- *syngo.*plaza Integration<br><br>- Query/retrieve from DICOM nodes<br>- Export images and Movie and creating patient media<br>- Filming (DICOM print) or postscript printing functionality<br><br>**Integrated elearning:**<br>- *syngo.*e-Learn – integrated electronic learning for *syngo.*via workflows and clinical applications.<br>- Available languages: English<br><br>**Prerequisites for all service related issues:**<br>- Availability of a customer administrator that performs dedicated administration and support tasks (e.g. 1st line support, data security, backup,...).<br>- Minimum broadband internet connection bandwidth for uncompromised service support are 2000 kBit/s downstream and 512 kBit/s upstream.<br>Otherwise, certain support services may not be provided and the agreed remote response time cannot be guaranteed.<br><br>Specification of minimum broadband internet connection in detail:<br>  - Downstream: 2000 kBit/s for Software update, IT- and Application support<br><br>  - Upstream: 512 kBit/s for Application support<br>  - Upstream: 256 kBit/s for Software update and IT support<br><br>**Scope of delivery:**<br>- DVDs with *syngo.*via software<br>(software license for one *syngo.*via client user) |
| **syngo.MR General Engine #1** | MR Radiology Workflows: predefined layouts for Head, C-Spine, T-Spine, L-Spine, Whole Spine, Breast, Prostate, Abdomen, Hip and Knee scans, Composed Images.<br>MR Cardio-Vascular Workflows: Cardiac, Angio Single Station, Angio Multi Station, Angio TimCT and Angio TWIST<br>MR Evaluation: Subtraction, MeanCurve, Image Filter, 2D/3D Distortion Correction.<br>Workflow optimized report template included.<br>MR Remaining Images: collection of additional data, that have not been loaded in any of the predefined layouts (e.g. additional scans, normally not part of the workflow). A single click that makes sure no data was missed by the user.<br><br>Scope of delivery:<br>- 1 x *syngo.*MR General Engine software package with MR Radiology Workflows<br>- MR Cardio-Vascular Workflows<br>- MR Evaluation |

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| **syngo.MR Cardiac 4D Ventr. Funct.#1** | Cardiac 4DVF provides volumetric cardiac data of an examined patient quickly and easily.<br>- Automated or manual segmentation of the left and right ventricle with workflow guidance.<br>- Volumetric and wall thickening analysis. Calculation of parameters like e.g. the ventricular ejection fraction (EF), end-systolic (ESV) and end-diastolic volumes (EDV), ventricular mass, cardiac output, stroke volume.<br>- Display of the model of the patient's heart superimposed on anatomical images as a reference in a 4D viewer.<br>- Dedicated cardiac reporting<br><br>Scope of delivery:<br>- 1 x *syngo*.MR Cardiac 4D VF software |
| **syngo.MR Cardiac Flow #1** | This application provides velocity- and flow-related data of an examined patient quickly and easily.<br><br>**Image Display**<br>- Two large screen segments for viewing magnitude and phase Images<br>- Synchronized movie display<br>- Application of color look-up tables similar to Doppler-ultrasound<br><br>**Automated Segmentation Tools**<br>- Semi-automatic edge detection for vessel lumen from initial user input<br>- Automatic compensation of in-plane motion as well as vessel size or shape changes<br><br>**Quantitative Analysis**<br>- Through-plane and in-plane flow analysis<br>- Background phase correction<br>- Display of value and location of peak velocity on each image<br>- Calculation of: Mean and peak velocity; mean, cumulative, forward and retrograde flow; regurgitation fraction<br>- Changes in vessel size<br><br>**Digital and Paper Reports**<br>- Various graphs: Velocity vs. time, flow rate vs. time, integral flow vs. time, area vs. time<br>- Summary tables<br>- Dedicated reporting of flow evaluation results.<br><br>Scope of delivery:<br>- 1 x *syngo*.MR Cardiac Flow software |
| **syngo Tissue 4D #MM** | Visualization features:<br>- 4D visualization (3D and over time)<br>- Color display of parametric cards (Ktrans, Kep, Ve, Vp, iAUC)<br>- Additional visualization of 2D or 3D morphological dataset<br><br>Post-processing features:<br>- Elastic 3D motion correction<br>- Fully automatic calculation of subtracted images<br><br>Standard curve evaluation:<br>- Calculation and display of enrichment curves<br><br>Pharmacokinetic model:<br>Pharmacokinetic calculation on a pixel-by-pixel basis using a 2-compartment model<br>Calculation is based on the Toft model. Various model functions are available.<br>Manual segmentation and calculation on the result images.<br><br>The following result images can be saved as DICOM images: |

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| **(Continued)**<br><br>**syngo Tissue 4D #MM** | - 3D motion-corrected, dynamic images<br>- Colored images<br><br>Possibility for exporting results in the relevant layout format. |
| **Server HW Config XL** | **Brief description**<br>Type: Hewlett Packard rack mount server.<br>Processor: 2 CPU<br>RAM: 72GB<br>System Disk: RAID Level 1<br>DB Data Disk: RAID Level 1<br>Data Disk: RAID Level 5,<br>1x Hot Spare for RAID 5<br>Image Storage: approximately 4.900 GB<br>Optical drive: CD/ DVD-RW<br>Graphical Processing Unit: 2x NVIDIA GPUs<br>Mouse: USB Optical Scroll Mouse<br>Keyboard: USB standard international<br>Rack mount kit for 19" HP rack included<br><br>Operating System: Windows Server 2008 R2, 64 Bit - Enterprise Edition<br><br>This server is configured with a redundant fan and a redundant power supply.<br><br>**Recommended Environment Requirements**<br>Server for operation only in server rooms<br>A 100 Mbit/s (minimum) / 1 Gbit/s (recommended) network environment is needed for optimal performance.<br>For remote access a 10 Mbit/s (minimum) / 16 Mbit/s (recommended) broad-band connection is required.<br><br>**Service Package**<br>Basic care pack for this server configuration is not included and has to be ordered separately!<br><br>Technical details are subject to change without notice! |
| **HP Care Pack. 5y 24x7 HW Support** | **Brief description**<br><br>The HP Care Pack Option "24 x 7 x 4 hours on-site" consists of the following deliverables:<br><br>- **Remote problem diagnosis and support** – Siemens Remote Services uses HP remote support tools to isolate your problem and facilitate resolution in close cooperation with the next HP service hub in your area.<br><br>- **24 hours x 7 days, 4h reaction time, break & fix service onsite** – For issues that cannot be resolved remotely, an authorized HP Services representative arrives at your site within 4 hours after a defect has been confirmed. HP Services returns your system to operational condition, repairing or replacing components or entire units. If required, HP services restore at the same time system and network functionality to allow Siemens Remote Services to seamlessly continue with any further required service activity.<br><br>- **Defective Media Retention Service** – This option lets you protect sensitive data by keeping your defective disk, without having to return a defective media to the manufacturer.<br>- **Integrated service management** – Siemens and HP has bundled a set of proactive and reactive service elements with Siemens and HP Mission Critical Engineers working together from joint service centers in your region. This optimizes the coordination and execution of all required service activities without unnecessary delays.<br>- **Proactive monitoring** – Proactive monitoring of HW status and events to be able to correct HW problems before they affect system stability.<br><br>- **Enhanced HW support** – Provision of necessary Bios- and Firmware update packages to keep the HW system up to date. Required patches and updates are provided remotely to be installed conveniently during |

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| *(Continued)*<br><br>**HP Care Pack. 5y 24x7 HW Support** | the next application maintenance or service window by the responsible IT system administrator.<br><br>-     **Enhanced OS support** – Provision of necessary hotfixes or service packs to keep the server system working reliably. Required updates are provided to be installed conveniently during an application maintenance or service window by the responsible IT system administrator. |
| **syngo MMWP Client #1** | **Brief description**<br>The *syngo* Multi Modality Workplace client is configured as a DICOM-connected standalone system. The workstation is ideal for providing additional or specialist clinical workplaces, and is particularly suited to multi-modality installations. The base viewing system can be extended by adding a wide range of cross-modality and modality-specific application options.<br><br>**Scope of delivery**<br>- PC<br>- Enhanced Graphics Card<br>- 12 GB RAM<br>- Base User software<br>- *syngo* 3D<br>- *syngo* Expert-i<br>- *syngo* CT Basic Evaluation<br>- *syngo* CT Dual Monitor<br>- User documentation in selected language<br>- 19" Monitor<br><br>**PC**<br>High Performance Windows XP based Workstation with a Quad-Core processor and a RAM capacity of 12 GB and a minimum disk capacity of 147 GB for patient data. The workstation is equipped with an Enhanced Graphics Card to support 3D applications. To exchange medical images on DICOM-compatible DVD-R, CD-Rs the system is equipped with a DVD-Recording unit.<br><br>PC can be connected to an existing network via 10/100 Mbit Ethernet and 1 Gbit Ethernet.<br><br>**Base User Software:**<br>Software features an intuitive and thus easy to learn user interface developed from prototypes tested in close cooperation with users.<br><br>Standard functions such as filming or image review, and optional clinical application software, are performed in individual processes on dedicated task cards. A number of functions and input parameters, as well as the language used, can be selected according to individual requirements.<br><br>**Package comprising the following software licenses:**<br>Base software with CD and dongle for the functions patient browser, filming, image review and system services.<br><br>*syngo* Patient Browser<br>Patient management<br>- DICOM 3 communication with Send, Receive, Query&Retrieve<br>- DICOM Print<br>- Reading of DVDs, CDs<br>- DVD-R module for writing DICOM-DVDs for data exchange. Writing is in background mode.<br><br>*syngo* Filming<br>A virtual film sheet shows a 1:1 display of the film sheets to be printed, thus permitting an effective preview of the filming job and re-windowing the images, as well as providing a large number of evaluation functions.<br><br>*syngo* SR Viewer<br>Reading and creation of DICOM structured reports.<br><br>*syngo* Viewing |

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| *(Continued)*<br><br>**syngo MMWP Client #1** | Image Review supports interactive 2D review, evaluation and documentation functions. Multiple studies from the same patient can be displayed side-by-side for comparison.<br><br>**Image display**<br>1024 x 1024 screen matrix, configurable as up to 64 image segments.<br><br>**CINE Display**<br>Automatic or interactive dynamic presentation technique for the visualization of time and volume series. Synchronized viewing of multiple series.<br><br>**Measurement and annotation:**<br>Text annotation; Distance, angle, circle, ROI and pixel lens, depending on information available from the acquisition system.<br><br>**Video sequences stored on offline media:**<br>Any user-selectable file, such as cardiac, DSA or InSpace AVI video sequences, can be burned to DVD, CD to prepare quality presentations and demos of pathologies.<br><br>**System services:**<br>Microsoft Office 2000 (except FrontPage) is supported (not provided).<br>Software for burning user-selectable files to DVD-R, CD ROM.<br><br>**Network module:**<br>For connection to a local Ethernet (10 or 100 baseT) for communication with networked printers, diagnostic and therapy workstations, HIS/ RIS systems and teleradiology routers.<br>Scope of functions:<br>Network stations can be configured.<br>Unlimited selection of stations.<br>DICOM: industrial standard for the transmission of information between DICOM-compatible units from different manufacturers. The scope of functions is described in detail in the DICOM Conformance Statement and in its standard version includes the Transmission/ Reception, Query/ Retrieve and Basic Print functions.<br><br>*syngo* **3D**<br><br>3D Basic<br>Basic 3D Viewer platform for display of 3D series with multi-planar reconstruction (MPR), shaded surface display (SSD), and maximum intensity projection (MIP).<br><br>3D VRT<br>Advanced 3D functionality as containing volume rendering technique (VRT) and advanced editing functions.<br><br>Fly Through<br>High quality SSD/VRT virtual endoscopic viewing using high performance rendering modes.<br><br>Image Fusion and FusedVision3D<br>Spatial alignment and visualization of image data of one patient where image data has been generated at different points in time or by different modalities. Visualization of fused anatomical and functional volumes via projection of the volumes onto an arbitrary oriented plane in full screen mode or together with the 3-orthogonal fused datasets. Allows precise localization of lesions while using either the Clip plane view or the Slab Plane view displays. Displays correlated rotating Maximum Intensity Projection (MIP), and special 3 x 3 layout to display correlated CT, PET and fused images.<br><br>3D Dual Monitor<br>Viewing and manipulation of two different datasets on two monitors.<br><br>*syngo* **Expert-i**<br>Enables the interaction with the *syngo* MMWP Client from virtually anywhere in your hospital.<br><br>*syngo* **CT Basic Evaluation**<br>Supports the evaluation of CT images through volume calculation and dynamic evaluation.<br><br>*syngo* **CT Dual Monitor**<br>Enables dual monitor operation for capable CT applications. |

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| *(Continued)*<br><br>**syngo MMWP Client #1** | **19" Monitor**<br>19 in high-resolution LCD flat panel color monitor (1280 x 1024 pixels) in landscape format for images and text. |
| **syngo Keyboard USA English** | *syngo* keyboard for the selected language. For easy operation of *syngo* browser, viewer and filming tasks. Special keys for windows, sheets, printing, marking and network communication. |
| **PACS-Driven Implementation Pkg.** | The PACS-Driven Implementation Package includes the following tasks:<br>- Activation of Siemens Remote Services connections<br>- Import of all *syngo*.via server license files<br>- Basic clinical configuration and integration of up to 5 DICOM nodes in *syngo*.via, such as one modality, one PACS, not more than two *syngo* MultiModality Workplaces 2009A, one printer, or one RIS/ DMWL-source including the request of a DICOM Modality Worklist sent to *syngo*.via for a networked Siemens scanner. All nodes need to be validated for connection with *syngo*.via.<br>- Installation of a software upgrade and a *syngo*.via client on one formerly installed *syngo* MMWP 2009A, already configured in *syngo*.via as a DICOM node;<br>Configuration DICOM access to *syngo*.via in *syngo* MMWP;<br>Integration of the basic *syngo* MMWP access into one *syngo*.via client workplace by installation and configuration of the software Expert-i on the *syngo*.via client.<br>- Frontend integration of *syngo*.via with one PACS workplace (for image call-up directly out of the PACS application user interface)<br>- Integration of *syngo*.via into the IT infrastructure using an existing Active Directory, consultation of the customer's IT administrator for routing/ports.<br>- Configuration of basic workflow rules: autodelete, archiving, autorouting in *syngo*.via<br>- Acceptance Test in cooperation with the customer<br><br>Context of the implementation tasks:<br>- The DICOM conformance of the DICOM nodes is prerequisite for connection to *syngo*.via.<br>- The DICOM nodes to be connected to *syngo*.via must be configured and tested by the customer, for e.g. configuration of the remote DICOM node *syngo*.via, routing rules, procedures. If necessary, the customer orders these services from the DICOM node's vendor.<br>- The DMWL-source must be able to provide the DMWL to *syngo*.via identical to the DMWL provided to the modalities.<br>- The configuration of the customer's Local Area Network is performed by the customer.<br>- Provision of a minimum broadband Internet connection bandwidth with 2000 kBit/s downstream and 256 kBit/s upstream for Siemens Remote Services (SRS) by the customer. If the customer does not provide SRS connectivity, then additional professional services for implementation without SRS support are offered. For service support after implementation the following minimum specification has to be provided: Downstream 2000 kBit/s (for Software update, IT- and Application support); Upstream 512 kBit/s (for Application support); Upstream 256 kBit/s (for Software update and IT support).<br>- The customer provides information, such as: IP addresses of the server for its network integration and the DICOM nodes identifiers.<br>- The customer provides the required power supply and the installation location for the server hardware.<br>- Presence and support of the customer's administrators (clinical and IT administrator) is required during implementation. In preparation for implementation support the customer's administrators have completed the *syngo*.via web-based trainings, which are part of the scope of delivery.<br><br>- A list of applications and systems with validated connectivity to *syngo*.via can be requested from your Siemens Sales Representative.<br>- If a DICOM node or another system has not been validated yet for connection to *syngo*.via by Siemens, then the customer will give his acceptance though there could be a narrowed functionality of the connection.<br>- Installation of *syngo*.via client software on additional workplaces, or configuration of additional DICOM nodes, or the distribution of the frontend integration to additional PACS workplaces are performed by the customer's administrator or can be ordered from Siemens separately as an option.<br>- Implementation of a new *syngo* MMWP 2010B (Hardware and Software) or a *syngo* MMWP software upgrade |

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| *(Continued)*<br><br>**PACS-Driven Implementation Pkg.** | to an on-site already installed sMMWP is performed as an additionally offered service.<br>- The image call-up implementation and configuration will be upgraded by the customer with future software versions of the calling application (RIS, PACS).<br>- Project coordination is performed by Siemens. Please see the *syngo*.via Data Sheet for system requirements and detailed description of implementation tasks. |
| **Server HW Installation Service** | This hardware installation service includes the following tasks:<br>- Unwrapping. Consolidation of all packaging material and notification to the customer that the materials are ready for removal.<br>- Mechanical and electrical connections at site of operation<br>- Mechanical installation in a common rack (e.g. HP, Fujitsu, IBM, Rittal) not older than three years and connection to a console.<br>- Connection to the power supply, to Uninterruptable Power Supply (if applicable)<br>- Startup of operating system; check status of patches, drivers, service packs and hot fixes, etc.<br>- Connection and network configuration of the server and the remote service board to the LAN<br>- Configuration of remote service board (network settings, users configuration)<br>- Handover of the readily installed system to the customer.<br><br>Context of the implementation tasks:<br>The customer provides, as described in the *syngo*.via Data Sheet:<br>- Access to the location and space for server operation<br>- Electrical power<br>- LAN access and LAN configuration<br>- Configuration of the broadband internet access for Siemens Remote Services<br>- IT Administrator's coordination and support for the mechanical and IT installation.<br>- Server and monitor(s) are on-site of operation. The customer's monitors are accompanied by appropriate cables. |
| **MMWP Client HW Implemention Service** | The *syngo* MMWP implementation includes the following tasks:<br>- Unwrapping of server and monitors (if applicable). Consolidation of all packaging material and notification to the Customer that the materials are ready for removal<br>- Mechanical and electrical connections at site of operation, connection to the power supply<br>- Startup of operating system, check status of patches, drivers, service packs and hot fixes etc., import of all license files for the *syngo* MMWP 2010A<br>- Connection to LAN; network configuration<br>- Activation of an additional Siemens Remote Services connection for *syngo* MMWP (if applicable)<br>- Basic clinical configuration, autodelete, archiving, autorouting on *syngo* MMWP<br>- Configuration on *syngo* MMWP for connection to one new modality (if sold in a bundle)<br>- Integration with *syngo*.via and one validated PACS, i.e. installation of *syngo*.via client on the *syngo* MMWP<br>- Basic integration of this *syngo* MMWP in one *syngo*.via client using Expert-i<br>- Enhancement of the *syngo*.via workflow rules configuration on the *syngo*.via server: autorouting referring to *syngo* MMWP<br>- Backup of the *syngo* MMWP configuration on DVD/ CD or on customer file server<br>- Acceptance test of the installed *syngo* MMWP in cooperation with the customer, handover of the readily installed system to the customer.<br><br>Context of the implementation tasks:<br>- The connection of one or two monitors to a *syngo* MMWP client does not include monitor calibration. Depending on local legal regulations, this monitor installation may allow viewing only.<br>The customer provides, as described in the *syngo*.via Data Sheet:<br>- Access to the location and space for *syngo* MMWP client operation as well as for the monitors (if applicable)<br>- *syngo* MMWP client hardware and monitor(s) are on site of operation. The customer's monitors are accompanied by appropriate cables.<br>- Electrical power |

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| *(Continued)*<br><br>**MMWP Client HW Implemention Service** | - LAN access and LAN configuration<br>- Configuration of the broadband internet access for Siemens Remote Services<br>- The customer provides the information for the *syngo* MMWP network integration, such as: IP addresses.<br><br>- Integration of the *syngo* MMWP on additional *syngo*.via clients (Expert-i) is performed by the customer's administrator<br>- Configuration of additional DICOM nodes in the *syngo* MMWP is performed by the customer's administrator. Optionally, configuration of additional DICOM nodes can be ordered from Siemens.<br>- Please see the *syngo*.via Data Sheet for the overall system configuration of *syngo*.via with *syngo* MMWP and detailed description of implementation tasks. |
| **syngo.via for Clinical Administrators** | The objective of this course is to give the participants the necessary theoretical knowledge and practical skills to routinely work with syngo.via and to become acquainted with the settings and configuration options of the system.<br><br>Target Group<br>This course is designed for clinical administrators, technologists and physicians who act as departmental key user for the syngo.via system.<br><br>Learning Target<br>syngo.via is a software solution intended to be used for viewing, manipulating, communicating and storing medical images. It supports interpretation and evaluation of examinations within healthcare institutions for example in Radiology, Nuclear Medicine and Cardiology environments. Having attended this course the participants will be able to comprehensively utilize the syngo.via basic operation and universal functionality. In addition the participants will get familiarized with the syngo.via configurations and setting options for applications, workflow and reporting issues.<br><br>Prerequisite<br>Basic application knowledge on imaging systems like CT, MI and MR<br>Understanding of clinical workflow<br>Basic understanding of IT and DICOM<br><br>Contents<br>syngo.via system overview, basic principles and user interface<br>Demonstration and exercises on<br>Patient Browser<br>Worklist management<br>Workflow management<br>2D/3D/4D image processing and evidence document generation<br>Transfer of data<br>Clinical configuration and setting options<br>User management<br><br><br>Duration<br>5.00 days |
| **Virtual syngo.via IT Admin Training** | syngo.via is the latest product from Siemens Healthcare for Advanced visualization of 2D/3D/4D data sets. This server client system is fully embedded in the customers IT infrastructure and allows access to information from anywhere to any modality and supports the user with appropriate, time saving reading workflow according to modality and disease. Having attended this course, the participant will understand the workflow and implementation concept of syngo.via. In practical exercises he learns to use the Service UI and is prepared to perform the administrative tasks. In addition basic first level support questions are covered.<br><br>Target Group<br>IT Administrators syngo.via responsible for local user management, regular maintenance tasks and first level service support<br><br>Learning Target<br>syngo.via is the latest product from Siemens Healthcare for Advanced visualization of 2D/3D/4D data sets. This server client system is fully embedded in the customers IT infrastructure and allows access to information from anywhere to any modality and supports the user with appropriate, time saving reading workflow according to |

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| **(Continued)**<br><br>**Virtual syngo.via IT Admin Training** | modality and disease. Having attended this course, the participant will understand the workflow and implementation concept of syngo.via. In practical exercises he learns to use the Service UI and is prepared to perform the administrative tasks. In addition basic first level support questions are covered.<br><br>Prerequisite<br>Basic understanding of clinical workflow<br>Basic IT know how<br>Basic DICOM knowledge<br><br>Contents<br>Overview of the Enterprise Platform and syngo.via<br>IHE, Infrastructure and Function View<br>Client install<br>Workflow configuration<br>Service UI<br>Trouble shooting Tools<br><br>Notice<br>Virtual training course for USA- No travel required<br><br>Duration<br>2.00 days |
| **Native syngo #Tim** | *syngo* NATIVE offers:<br>- Non-contrast enhanced MRA<br>- Separate imaging of arteries and veins<br>- Visualization of - e.g. - renal arteries or peripheral vessels<br><br>The *syngo* NATIVE package comprises:<br>- *syngo* NATIVE TrueFISP<br>- *syngo* NATIVE SPACE |
| **Abdomen Dot Engine #T+D** | **Abdomen Dot Engine**<br>*Guidance view*<br>- Step-by-step user guidance is seamlessly integrated.<br>- Example images and guidance text displayed for each step of scanning workflow.<br>- Both images and text are easily configurable by the user<br><br>*Patient View*<br>- Easily tailored to the individual patient.<br>- Several pre-defined, integrated Dot Exam Strategies are included<br>- Single click update of queue and the complete scan set-up.<br>- Integrated contrast media protocols (Vibe Dynamic)<br><br>*Parameter View*<br>- A new view that displays the essential parameters<br>- Can be opened at any time during an examination<br><br>**Automatic sequence scaling**<br>- Auto FoV: optimal FoV is proposed, based on the localizer images.<br>- AutoNavigator: based on automatic breathing pattern detection and scaling of triggered scans.<br>- Breath-hold adaptations<br><br>**Dot Exam Strategies**<br>Personalize to the individual patient condition and clinical need.<br>- Predefined strategies:<br>  - Standard with breath-hold<br>  - Standard with PACE triggering |

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| **(Continued)** | -     Limited patient capabilities using *syngo* BLADE and PACE triggering. |
| **Abdomen Dot Engine #T+D** | ***Dot Decisions***<br>Seamlessly integrated into scanning workflow:<br>-     Select the queue and the appropriate protocol or set of protocols are automatically added.<br>-     Abdomen Dot Engine integrates MRCP and Diffusion decision points.<br><br>**Timeline setup and monitoring**<br>Convenient visual overview of multi-phase breath-hold examinations and CM enhancement curve visualization.<br><br>***Auto Voice Commands***<br>-     Played automatically<br>-     Facilitate timing of scanning, breathing and contrast media.<br>-     The user controls breath-hold or pauses are actually played<br>-     Ability to add pauses between automatic breath-holds.<br><br>***Auto Bolus Detection***<br>-     Automatically initiates the dynamic upper abdomen examination based on bolus detection.<br>-     The user can override this function.<br><br>***Inline radial range calculation for MRCP***<br>-     MRCP is measured<br>-     Inline Radial Ranges are automatically generated.<br><br>***Inline Subtraction***<br>Automatically subtracts the native (non-contrast) measurement from the arterial, portal-venous and late phase.<br><br>***Inline Registration***<br>The system automatically performs a registration / alignment of the anatomy for the different dynamic phases, of interest when examining nodular enhancing pathologies.<br><br>***Customization***<br>Existing Dot Engines can be modified by the user to their individual standard of care.<br>-     Add / remove protocol steps<br>-     Change guidance content (images and text)<br>-     Change or add Dot Exam Strategies and Decision Points<br>-     Modify the Parameter View |
| **Inline Composing syngo #Tim** | The Inline Composing option includes the following functions:<br>- Inline calculation of full-format images of the spine, the central nervous system or the vessel tree, for example, combined from multiple overlapping steps.<br>- Dedicated composing algorithms, optimized for the generation of anatomical or angiographic full-format images.<br>- Data sets with different FoV, resolution, matrix and slice thickness can be combined.<br>- Generation of full-format images from inline-computed MIPs.<br>- Different inline functions can be combined; e.g. in case of multiple-step angios, Inline subtraction, Inline MIP and Inline Composing can be performed fully automatically.<br>- Full-format acquisitions from Inline Composing are ideal for further measurement planning on large FoV, e.g. with the Tim Planning Suite (optional, urgently recommended).<br><br>*Prerequisite: Software syngo MR B13.* |
| **Tim Planning Suite** | - Easy planning on a FoV of any desired size (up to 205 cm).<br>- Planning of multiple steps simultaneously, e.g. on a whole-body image, with only one Set-n-Go protocol - which includes several steps.<br>- Tim Planning Suite UI: Dedicated user interface and exclusive tools for effective and smooth working on a large FoV.<br>- Multiple slice groups with their overlap are displayed together and can be easily arranged.<br>- All steps can have independent sets of parameters. |

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| *(Continued)*<br><br>**Tim Planning Suite** | - All steps are displayed together with a single mouse click.<br>- Easy positioning of all steps, for example, through Align FoV.<br>- Full support of .<br>- Full support of Phoenix, thus maximum reproducibility, for example, for follow-up studies, multi-centric studies or exchange of experiences across different institutions.<br>- Dedicated protocols are provided for the Tim Planning Suite, for example, for orthopedic, oncological or angiograhic indications.<br>- Inline Composing for optimized workflow for the generation of full-format images of anatomic or angiographic data sets is a prerequisite. Efficient measurement planning on these full-format images with Tim Planning Suite.<br>- It is highly recommendable to order application training!<br><br>*Prerequisite:  Software syngo MR B13* |
| **Tim Whole Body Suite #T+D** | Tim and the Tim Whole Body Suite enable for true whole body MR scanning for head-to-toe imaging. Whole body imaging with highest image quality without patient repositioning and without the need to change a single coil, not even once, this means whole body imaging without compromise.<br><br>The Tim Whole Body Suite features:<br><br>- The all-new Tim Table or Tim Dockable Table enable a full Field-of-View with coverage up to 205 cm (6' 9"). The table top has the same length as the standard system without whole body capabilities. Additional free space is required at the rear part of the magnet to ensure, that the table movement is not limited by the rear wall.<br>- Table movement to its full extent can be remotely controlled from the operator console either by the operator or by sequence protocols.<br>- Protocols and programs for whole body MR angiography and morphology e.g. for metastasis visualization and preventive care examinations.<br>- Whole body MR Angiography is possible with high speed, high resolution and high image contrast on the entire volume combining high speed gradients and iPAT.<br>- The large FoV of 205 cm supports the assessment of metastases distribution in the body with sequences such as TIRM (Turbo Inversion Recovery).<br>- |
| **Cardiac Dot Engine, USA #T+D** | **Cardiac Dot Engine**<br>*Guidance View*<br>- Step-by-step user guidance is seamlessly integrated.<br>- Example images and guidance text are displayed for the individual steps of the scanning workflow.<br>- Both images and text are easily configurable by the user<br><br>*Patient View*<br>- Within the Patient View the user can easily tailor the exam to each individual patient (e.g. patient with arrhythmia, breath hold capability).<br>- Pre-defined Dot Exam Strategies are integrated. The user just selects the appropriate strategy with one click and the queue and the complete scan set-up are automatically updated<br><br>*AutoFoV (automatic Field of View calculation)*<br>- Based on the localizer images the optimal FoV is automatically estimated.<br>- If the patient moves during the examination, this step can be repeated at any time<br><br>*Automated parameter adaptation*<br>- Scan parameters are automatically adapted to the patient's condition (e.g. heart rate)<br><br>*Novel heart localization method*<br>- On-board guidance visually facilitates anatomic landmark settings which are used for calculation<br>- Automated localization<br>- Automated localization of short-axis views<br><br>*Cardiac Views*<br>- Easy selection of cardiac views (e.g. 3 chamber view) during scan planning |

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| **(Continued)**<br><br>**Cardiac Dot Engine, USA #T+D** | ***Inline Ventricular Function Evaluation***<br>- *syngo* Inline VF performs volumetric evaluation of cardiac cine data fully automatically right after image reconstruction.<br>- If desired, inline calculated segmentation results can be loaded to 4D Ventricular Function Analysis for further review or processing<br><br>***Cardiac specific layout for the Exam task***<br>- layouts show the new physio display and are configured for every step of the exam<br><br>***Automated Naming***<br>- Automated naming of series depending on cardiac views and sequence type<br><br>***Auto Voice Commands***<br>- Seamlessly integrated into scanning workflow.<br>- Played automatically<br>- The user controls breath-hold or pauses are actually played<br>- Ability to add pauses between automatic breath-holds<br><br>***Dot Exam Strategies***<br>The workflow can be personalized to the individual patient condition and clinical need. The following predefined strategies are included. They can be changed at any time during the workflow:<br>- **Standard:** Segmented acquisition techniques<br>- **Limited patient capabilities**: switch to real-time and single shot imaging if breath-hold is not possible or arrhythmias occur<br><br>***Customization***<br>Existing Dot Engines can be modified by the user to their individual standard of care.<br>- Add/remove protocol steps<br>- Change guidance content (images and text)<br>- Change or add Dot Exam Strategies and Decision Points<br>- Modify the Parameter View |
| **Flow Quantification #Tim** | Flow Quantification enables the acquisition of flow encoded images and the evaluation of blood as well as of cerebro-spinal fluid (CSF).<br><br>Sequences include:<br>- ECG triggered 2D phase contrast with iPAT support<br>- Retrospective reconstruction algorithms for full R-R interval coverage<br>- Maxwell Term Compensation |
| **Advanced Cardiac Package #T+D** | Combining the unique advantages of Tim and *syngo* BEAT with iPAT and powerful gradients, it allows performing cardiac MR examinations without compromise in image resolution or acquisition speed.<br>*syngo* BEAT is a unique tool for fast and easy cardiovascular MR imaging. It provides 1-click switch from cine imaging to tagging for wall motion evaluation and 1-click switch from 2D to 3D imaging. *syngo* BEAT automatically adjusts all parameters associated with the changes.<br><br>**Cardiac and Vessel Morphology**<br>- Multi echo technique for e.g. thalassemia assessment<br>- 3D aortopathy imaging with free breathing (SPACE)<br><br>**Global or Regional Wall Motion Analysis with *syngo* BEAT**<br>- 3D cine acquisition for full CT-like heart coverage<br>- 2D segmented FLASH for visualization of the regional wall motion using various tagging techniques (grid or stripes) |

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| *(Continued)*<br>**9**<br>**Advanced Cardiac Package #T+D** | **Dynamic myocardial imaging with *syngo* BEAT**<br>- Ultra-fast, high-SNR sequence for dynamic imaging with GRE EPI contrast for stress and rest exams<br><br>**Tissue characterization with *syngo* BEAT**<br>- Robust myocardial tissue characterization with 3D PSIR (phase-sensitive inversion recovery), e.g. after myocardial infarction or for differentiation of cardiomyopathies<br>- Fast and complete coverage of the myocardium with IR 3D FLASH and TrueFISP<br><br>**Coronary imaging with *syngo* BEAT**<br>- 3D Whole-Heart non-contrast Coronary MRA<br>- 3D Whole-Heart MRA with advanced free-breathing navigator compensating diaphragm shifts during the acquisition (motion-adaptive respiratory gating) |
| **AutoAlign Spine #Tim** | After moving a transverse slice package near an intervertebral disk the AutoAlign Spine algorithm automatically localizes the disc and optimizes the positioning:<br>- parallel to the disc compensation in double oblique in the coronal and sagittal plane<br>- standardized center of slices: midway on the posterior margin of the vertebral body<br><br>As a result of the double oblique optimization the foramina and nerve roots are visualized symmetrically even in most patients with scoliosis. Due the standardization of the center of the slice packages all transverse images show the vertebral bodies and the spinal canal always in the center of the image. This way the preparation of the images for reading becomes faster: no pan necessary to align images from different discs, zooming can be done for all transverse slice packages at the same time.<br>This way AutoAlign spine speeds up all steps from the measurement of spinal exams to reading and increases the diagnostic confidence. |
| **Inline Perfusion #Tim** | **Inline Technology – Processing Instead of Post-processing.**<br>Inline Technology helps to streamline the clinical workflow by automating post-processing steps before image viewing. This facilitates getting clinical results immediately. This package integrates Inline technology with perfusion imaging. Automatic real-time calculation of Global Bolus Plot (GBP), Percentage of Baseline at map (PBP) and Time-to-Peak map (TTP) with Inline technology is possible.<br><br>An optimized EPI sequence for perfusion-diagnostics is included in the standard Tim Application Suite. With this package real-time calculations are done of anatomical images and, in addition, of a global bolus plot and a Time-to-Peak map for visualizing the time dependence of tissue perfusion. |
| **SWI #Tim** | Despite a strong sensitivity for local magnetic field inhomogeneities Susceptibility Weighted Imaging (SWI) as a 3D technology keeps up the signal near large susceptibility leaps due to very thin slices and high resolution in the slice (high image quality e.g. in the area of the forebrain near the frontal sinus).<br>Moreover, the phase information of the MR signal is integrated in the image display. In order to further increase sensitivity for localized microscopic magnetic field inhomogeneities, large-area magnetic field inhomogeneities (e.g. caused by susceptibility leaps near the sinus) are specifically suppressed in the phase images.<br>This allows even small amounts of deoxygenated hemoglobin (e.g. in cerebral veins) or from products of hemoglobin decomposition (e.g. from hemorrhages) to be displayed.<br>Interesting measuring times for the ultra-high-resolution 3D protocols are achieved through parallel imaging with iPAT (GRAPPA).<br><br>The Susceptibility Weighted Imaging package includes:<br>- SWI measuring sequence, iPAT compatible<br>- optimized measuring protocols for the head<br>- inline-postprocessing for automatic calculation of relevant images within the scope of image reconstruction:<br>- calculation of susceptibility-weighted images<br>- venous angiography: MIP of a thin slice block<br>SWI has been optimized for clinical use to support diagnostics with cerebrovascular diseases (e.g. cerebral insult), venous malformation, brain trauma and tumors.<br><br>*Prerequisite: Software syngo MR B13* |

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| **TWIST syngo #Tim** | *syngo* TWIST provides:<br>- Visualization of contrast agent dynamics in the vessel system of interest with maximum flexibility.<br>- Needs only a low amount of contrast agent.<br>- Imaging in all body regions, e.g. carotids, pulmonary and peripheral vessels with brilliant spatial and temporal resolution.<br>- Clear separation of the arterial and venous phase.<br>- High speed acquisition by intelligent k-space strategies and use of iPAT, powered by Tim.<br>- *syngo* TWIST provides fat suppression using water selective excitation.<br>- Inline technologies, such as subtraction and MIP are provided for optimal workflow.<br>- In case of very high spatial resolution *syngo* TWIST may even replace conventional static MR angio. Moreover, *syngo* TWIST does not require any bolus timing - just inject and go. |
| **Peripheral Angio 36 #Ae** | The Peripheral Angio 36 has a 36-element design with 36 integrated preamplifiers distributed over 6 planes with 6 elements each.<br>A uniquely designed non-ferromagnetic coil cart for safe coil storage is included. The PA Matrix Coil is also shipped with a set of positioning cushions for proper handling.<br><br>No tuning of the fully iPAT-compatible Peripheral Angio 36 is required.<br><br>With a length of about 1m both legs are covered from the iliac artery level down to the foot arch vessels using multiple, flexible wings. For the visualization of the abdominal aorta and the iliac bifurcation it can be combined with the Body 18 and Spine 32. For larger body coverage eg whole body with up to 205 cm possible coverage, it can be combined with Head/Neck20 or a further Body18 to allow for large Field of View examinations with high patient comfort. Patient set up is done once and no repositioning is necessary<br>For peripheral Angiography the PA Matrix coil will be typically used in feet-first position, but also head-first positioning for whole-body examinations is possible (optional Tim Whole Body Suite required).<br><br>The dimensions of the Peripheral Angio 36 are:<br>860 mm × 300 - 640 mm × 280 mm |
| **Shoulder 16 Coil Kit #Ae** | The iPAT compatible Shoulder 16 Large and Shoulder 16 Small are ergonimically designed and adapted to the shape of the shoulder.<br>The different sizes obtain maximum image quality for different body sizes:<br>- 165 mm (6.5 in) diameter for small and medium sized shoulders<br>- 200 mm (7.9 in) diameter for large shoulders<br><br>The coils can be used either for left or right shoulders. It features sliding attachments to the base plate and can easily be adjusted for comfortable positioning. The coils excels in highest resolution imaging with exceptional signal/noise ratio. |
| **Tim Coil Interface 1.5T** | This adapter will be required if the following coils will be used on the MAGNETOM Aera.<br>- Tx / Rx 15-channel Knee Coil (two adapters required)<br>- CP Extremity Coil<br>- 4-channel BI Breast Coil<br>- 16-channel AI Breast Coil (two adapters required)<br>- 2/4/8-channel Sentinelle BreastCoil<br><br>The adapter can be plugged in any the SlideConnect plug of the Aera system. The Tim Coil Interface has a compact design and measures only approx. 190 mm x 90 mm x 33 mm (W x H x D). |
| **Tx/Rx 15-channel Knee Coil #Ae** | Thanks to its 15-channel design this coil is perfectly suited for high-resolution images with excellent SNR. With the arrangement of the antennas in three rings of 5 elements each, the coil is specially designed for parallel imaging with high acceleration factors.<br>The coil is positioned on a laterally movable support and therefore allows for comfortable patient positioning of both legs for off-center examinations. Furthermore, the upper part can be removed for easier patient positioning. Additional cushions allow for optimum patient immobilization. |

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| *(Continued)*<br><br>**Tx/Rx 15-channel Knee Coil #Ae** | The integrated transmission function makes volume-sensitive excitation with greatly reduced RF power possible on the one hand and, on the other, prevents aliasing artifacts (e.g. due to the other knee). |
| **Body 18 #Ae** | The Body 18 has a 18-element design with 18 integrated preamplifiers that are arranged in 3 clusters of 6 coil elements each. The Body 18 will be typically used together with the Spine 32 with which it operates in an integrated fashion as a 30-element coil, resulting in 3 rings of 10 elements each for highest SNR and fast imaging. It can be positioned in different orientations and addresses the requirement range for the examinations of obese patient to pediatric patients. The light weight coil improves patient comfort and can be easily connected via SlideConnect technology. No tuning of the fully iPAT-compatible Body 18 is necessary allowing for effiecient and patient friendly set-up.<br><br>For examinations where larger anatomicl coverage is required, several Body 18 coils can be used simultaneously. Up to four Body 18 can be used simultaneously, but typically two Body 18 will be used for coverage of the entire abdomen or in the case of large patients.<br><br>The Body 18 is typically used in combination with the Spine 32 for examinations of the thorax, abdomen, pelvis or hip and is also well suited for cardiac or vascular applications. In addition, the Body 18 can be combined with the Spine 32, further Body 18 (optional), the Peripheral Angio 36 (optional), but also the Head/Neck20 and the 4-channel flex coils (e.g. Flex Large 4, Flex Small 4) it contributes for all large-Field-of-View applications up to whole-body imaging.<br><br>The dimensions of the Body 18 are 385 mm × 590 mm × 65 mm (L x W x H). Its weight is about 2 kg (4.5 lbs), whereas the patient feels as little weight as 1kg (2,25 lbs). |
| **MR Workplace Table 1.2m** | The table design matches the MED-wide uniform design with silver-finished rim, use of friendly colors matching the Siemens color pattern for MAGNETOM and SOMATOM.<br>- Width 120 cm<br>- Depth 80 cm<br>- Height 72 cm |
| **MR Workplace Container, 50cm** | The table design matches the MED-wide uniform design with silver-finished rim, use of friendly colors matching the Siemens color pattern for MAGNETOM and SOMATOM.<br>Table height 72 cm, matching the *syngo* Acquisition Workplace and *syngo* MR Workplace console table, for installation in the operator room either directly to the left or right of the *syngo* Acquisition Workplace or *syngo* MR Workplace console table or separately.<br>- Width 50 cm<br>- Depth 80 cm<br>- Height 72 cm<br><br>Alternatively this casing is also suited for the Recon image processor (except for the MR systems with the Tim generation: there the Recon image processor is always placed inside the electronics cabinet). |
| **Coil Storage Cart #T+D** | The cart may be rolled to convenient locations in the examination room and can be opened up to work like a shelf. The coil storage cart has multiple drawers and trays as well as many other storage spaces for coils, cushions and miscellaneous items.<br><br>Its dimensions are: Width 140 cm (4' 7") when closed and 280 cm (9' 12") when opened, depth 54 cm (1'9") and height 121 cm (3'12"). |
| **Eco Chiller 60kW** | **Chiller KKT ECO 133 - L**<br><br>Function:<br>Supplies dedicated primary chilled water in cases where no chilled water supply is available on site.<br>Air-cooled version, for outdoor installation up to a maximum distance of 25 m for connection to the IFP, incl. 50 m FOC for control.<br><br>The cooling capacity of the chiller is 60 kW, the chilled water temperature is 20°C, the water flow is 130 l/min. |

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| *(Continued)*<br><br>**Eco Chiller 60kW** | Ambient temperature: -20 to +48°C<br>Connection rating: 28 kW<br>Voltage: 3/PE 400 V to 480 V / 50/60 Hz<br>Fuse rate: 80 A<br>Power consumption: 66 A<br>Dimensions: 2000 mm x 1100 mm x 2100 mm (height x width x depth).<br>Weight: 760 kg<br><br>Noise level at a distance of 10 m at outside temperatures of:<br>21°C 47 dB(A)<br>32°C 52 dB(A)<br>48°C 58 dB(A)<br><br>**IFP (Interface Panel)**<br>Main functions of the IFP:<br>- Interface function between the KKT chiller and the MR cabinet.<br>- Water supply for MREF, MBB, CBB and TX box.<br>Additional devices such as integrated differential pressure control, a pressure gage, and a filter are used in order to guarantee the precise functioning of the cooling circuit, especially for the cold head compressor (MREF).<br>The connection must be made locally with 2" lines up to a maximum distance of 25 m.<br><br>Dimensions: 800 mm x 1150 mm x 210 mm (height x width x depth).<br>Weight: 67 kg |
| **UPS Cable #Tim** | Power cable to connect the 3 KVA Powerware 9125 small UPS system (pn PWR9125H3000) to the ACC cabinet of the MAGNETOM Avanto/ Espree/ Tim Trio for backing up the host computer and imager.<br><br>Configuration includes connection box.<br><br>The standard cable length is 9 m. |
| **UPS Powerware PW9130G-3000T-XLEU** | Voltage range: 180 - 276 V<br>Input frequency: 50 / 60 Hz<br>Output voltage: 230 VAC<br>Dimensions (H x W x D): UPS 346 x 214 x 412 mm<br>incl. UPS bracket set<br>Weight: approx. 36 kg |
| **Armrest #MR** | An MR-compatible arm rest that supports the patient's arm on the magnet patient table when starting intravenous lines. The board is removed after the IV is inserted.<br><br>This product has been tested and verified for compatibility with the following Siemens' products: MAGNETOM Trio, Verio, Espree, Essenza, Avanto, Symphony, Area Skyra and Biograph mMR. Compatibility with other products cannot be assured and may void service contracts and/or system warranties. |
| **Spectris Solaris EP Injector iCBC** | Includes Spectris Solaris EP injector and Integrated Continuous Battery Charger (ICBC).<br>- Optimized color touch screen with few keystrokes.<br>- Six user-programmable phases for added flexibility.<br>  - Independent Keep Vein Open (KVO) allows more time to focus on patient.<br>  - Large 115 mL saline syringe allows for longer KVO and multiple flushes.<br>  - Design of low pressure tubing eliminates dead space in the "T" connection that can waste contrast.<br>  - The clear barrel design with molded FluidDots help detect the presence of air in a syringe.<br>  - Pressure Limit Setting control software enables user to select from one to six preset maximum pressure limits, ranging from 100-300 psi, and to view current pressure during injection next to the pre-selected maximum value on the Solaris display.<br><br>Installation, applications and one year warranty provided by Medrad. |

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| *(Continued)*<br><br>**Spectris Solaris EP Injector iCBC** | **Not for mobile use, refer to Siemens part number M3SSMR300EPM for the Solaris injector used in a mobile environment.**<br><br>**This product has been tested and verified for compatibility with the following Siemens' products: MAGNETOM Trio, Espree, Essenza, Verio, Avanto, Symphony, Aera, Skyra and Biograph mMR. Compatibility with other products cannot be guaranteed and use with any other products may void service contracts and/or system warranties.** |
| **Mapit syngo #Tim** | Features:<br><br>- 3D VIBE sequence for Inline T1 mapping<br>- Multiecho spin echo sequence for Inline T2 mapping<br>- 3D Multiecho gradient echo sequence for Inline T2* mapping<br>- iPAT compatibility<br>- Protocols for Inline parametric mapping<br><br>Using iPAT the 3D sequences provide isotropic imaging extremely high resolution while maintaining clinical measurement times. These data sets allow for the multi planar reconstruction of all planes. 3D is necessary to properly visualize the whole articular cartilage since it typically has a complex shape. In addition the accuracy of isotropic high resolution 3D data sets is superior because partial volume effects between e.g. synovial fluid and cartilage are minimized.<br>For the visualization of the parametric maps in the anatomical context the maps can be displayed as a colored overlay onto anatomical images using the optional package "*syngo* Image Fusion" |
| **Image Fusion syngo** | **CT, MR, NM, or PET images** are accepted as input for image fusion. Studies can be done with the same modality or with different modalities.<br><br>**Registration Algorithms:**<br>- Easy-to-use visual alignment with 6 degrees of freedom (3x translation, 3x rotation)<br>- Landmark based registration with convenient landmark editor for point-based registration using anatomical landmarks<br>- Automatic registration<br>- Storage of transformation matrix after registration for later retrieval with datasets<br><br>**Visualization Techniques:**<br>- Side by side visualization of both datasets with correlated pointer and correlated scrolling with dog ears<br>- 2D alpha-blending in monochrome or pseudo-color with adjustable balance between the two superimposed data sets.<br><br>Storage of fused results as secondary capture images. |
| **Hand/Wrist 16 #Ae** | The 16-element coil with 16 integrated pre-amplifiers excels in highest resolution imaging with exceptional signal/noise ratio, while taking full advantage of iPAT in all directions.<br><br>Hand/Wrist 16 is ergonomically designed and adapted to the shape of the hand/wrist region. The coil features a hinged design of the upper part and slidable attachment to the base plate. Together with the included stabilization pads the coil allows easy, fast and comfortable patient positioning. |
| **Foot/Ankle 16 #Ae** | The 16-element coil with 16 integrated pre-amplifiers excels in highest resolution imaging with exceptional signal/noise ratio, while taking full advantage of iPAT in all directions.<br><br>Foot/Ankle 16 is ergonomically designed and features a boot-like coil design. Together with the included stabilization pads the coil allows easy, fast and comfortable patient positioning. |