

SHIP TO: WAREHOUSE BB1003  
V.A. Medical Center  
400 VETERANS AVENUE  
BUILDING 26  
BILOXI, MS 39531-2410

520-B81003

**HC/HT Specifications**  
**MRI**

520-B81003

**MRI Technical Requirements**

1. Gradient:\*
  - to meet or exceed following specs: 33 mT/m (57 mT/m effective), peak slew rate up to 120mT/m/ms (208 mT/m/ms effective).
2. Radiofrequency:
  - Vendor specific
3. FDA 510(k) approved
4. Capability for 3 dimensional image creation
5. 1.5 Tesla
6. Bore diameter at least 70 inches
7. Bore length at least 75 inches (190.5 cm)
8. Acquisition rate of at least 6000 images per second
9. Interface with Carestream PACS
10. Non-ferrous injector
11. Remote physiological monitoring and synching
12. Capability for non-ferrous patient entertainment system
13. At least 1-year warranty
14. HL7 integration (HIS/RIS)
15. DICOM and IHE- Q/R, MWM, STORAGE COMMIT SCU, MPPS
16. Power conditioning (as defined by vendors)
17. UPS (designed to cover the time required to switch to Emergency Power) to cover gantry and cryogenics
18. Operating system must be Windows 7 or proprietary
19. If server is included, operation system must be Windows 2012R2 with SQL2012
20. Control panels within the MRI bore area on both left and right sides of bore (table control panel)

**Table Technical Requirements**

1. Full articulation of the table, detachable/mobile table **with side rails**
2. Patient weight capacity of 550lb for horizontal usage and 400 lbs. for vertical usage
3. encourage to submit bids with highest wait support
4. blanket warmer

**Chiller Requirements**

1. Zero boil off during normal conditions
2. At least 6800 BTUs

**Workstation Technical Requirements**

1. Operators workstation including UPS (as defined by vendors)
2. Technologist workstation including UPS (as defined by vendors)
3. Ability to burn at acquisition station

**Advanced Applications**

1. Integration with contrast injection unit
2. Post-processing:
  - Functional MRI (f-MRI)
  - Protocol sharing
  - Diffusion tensor imaging

- Metal artifact reduction
- Adipose-tissue reduction/suppression
- Motion cancellation
- Noise suppression (reduction)

3. Coils:

- Head/brain
- Bone
- Neck
- Spine
- Body/torso
- Shoulder
- Vascular
- Small extremities coils (i.e. – wrist, hand, foot, etc.)
- Knee

4. Applications:

- 3 dimensional images
- Isotropic volume capabilities
- Scanning MRI conditional implants
- Soft tissue visualization for orthopedic implants

## **Training**

### Technologist Training:

1. Initial Onsite Applications Training (minimum 4 days) – to be used 1 week prior to Go-Live for technologists
2. Go-Live onsite Applications Training (minimum 4 days) – to be used for technologists
3. Follow-up Onsite Applications Training (minimum 2 days) – to be used with the first 9 months from Go-Live for technologists
4. Offsite Training – for four Radiology technologists
5. Offsite Training Travel Package – for four Radiology technologists (Lodging/Meals/Transportation)

### Physician Training:

1. Go-Live onsite Applications Training (minimum 4 days) – to be used for Physicians
2. Follow-up Onsite Applications (minimum 4 days) – to be used with the first 9 months from Go-Live for Physicians
3. Offsite Training – for two Physicians
4. Offsite Training Travel Package – for two Physicians (Lodging/Meals/Transportation)

### Technical Training:

1. Technical Biomedical Engineering Training
2. Technical Biomedical Engineering Training Travel Package (Lodging/Meals/Transportation)

## **Support and other Documentation to Provide:**

1. Provide DICOM Conformance Statement
2. Provide completed Pre-procurement Assessment form (6550)
3. Provide information about your company's applications and technical support structure during the warranty period (i.e. a listing of Field Service Engineer locations and availability, support 800 phone number(s), remote support, etc.)
4. Provide information about your company's applications and technical support structure during after the warranty period (i.e. a listing of Field Service Engineer locations and availability, support 800 phone number(s), remote support, etc.)

Line #	Description	Qty
1	Ingenia S 1.5T Q3 2017	1

#### **INGENIA S 1.5T Q1 2018**

Ingenia with dStream architecture provides flexible and intelligent tools for faster exams and more consistent scanning, as well as excellent clinical performance for a variety of applications – all while increasing patient comfort. Designed for today and tomorrow, it is a safe investment that will serve your needs well into the future.

The system software supports a new generation of clinical options for head, neck, spine, MSK and body imaging. In addition, it brings important improvements to the scanner GUI for better control and usability throughout the MR exam, including:

- Smart conflict management for improved workflow
- Selective archiving for better control of archiving & export
- Combined accession numbers for improved scan efficiency during procedure based billing
- AutoSPAIR, software controlled SPAIR delay time for consistent fat suppression
- Increased patient database image bulk storage capacity to  $\geq 250\text{GB}$
- Patient specific safety protocols with SAR/PNS management

At the heart of the Ingenia is the new dStream architecture. dStream comprises:

- DirectDigital RF receive technology, which samples the MR signal directly in the RF coil on the patient.
- FlexStream workflow, which increases system versatility and throughput
- EasyExpand, which enables plug and play expansion of clinical capabilities without major upgrades

Philips Ingenia significantly improves MR image clarity, speed and expandability.

- Clarity: By digitizing the signal directly on the patient, dStream captures image data where the signal is at its purest.
- Speed: Patient and coil handling have never been easier: flexible exam setup to meet each patient's unique situation, simplified coil changeover and optimal quality for any exam.
- Expandability: The number of channels is determined by the coil, rather than limited by the system. This makes the MRI system forward-compatible to easily access emerging applications like body and cardiac and new enhancements for established applications like neuro and musculoskeletal imaging.

#### **dStream architecture**

Unique digital broadband MR architecture capturing the purest MR signal combined with enhanced workflow and ease of use to provide increased SNR and greater efficiency in your daily operations. In addition the number of channels is no longer determined by the MR system.

Line #	Description	Qty
	<ul style="list-style-type: none"> <li>Up to 40% greater signal-to-noise ratio (DirectDigital)</li> <li>As much as 30% improvement in throughput (FlexStream)</li> <li>Easy expandability of clinical capabilities without the need for major system upgrades (EasyExpand)</li> </ul>	

### **Xtend design**

System design optimized not only to provide a 70cm wide bore, but also to provide optimum quality and performance for imaging even the largest patients. Industry-leading magnet, gradient and system body coil designs provide the largest field-of-view for a 70cm system. Xtend offers the best combination of magnet homogeneity and gradient performance over a 55 cm FOV.

- Image eyes-to-thighs in as few as 2 stations
- Excellent large FOV and off-center imaging, ideal even for large patients
- Increased image accuracy for large FOV and multi-station exams

### **Magnet system**

- Xtend ultra-large up to 55 cm field-of-view combined with a 70cm bore system, enabling uncompromised coverage and imaging of large patients.
- Actively-shielded, lightweight design (<3300 kg) and compact fringe field (2.4 x 3.8 m) footprint for easy siting.
- Ultra compact patient-friendly magnet design - only 1.5m in length
- Best-in-class magnet homogeneity (1.8 ppm / 50 x 50 x 45 cm V-RMS) for excellent image quality, off-center imaging and fat suppression.
- Superconducting screening coils to reduce magnetic field susceptibility caused by moving external ferrous objects.
- HeliumSave zero boil-off technology for zero helium consumption (0 l/hr) under regular scanning conditions.
- Side turret design for easy installations even with low ceiling and difficult access

### **Gradient system**

#### **Omega Gradients**

High-performance gradients specifically designed for a wide bore magnet. Omega provides a high linearity and maximum peak and slew rate over the entire imaging field of view.

- Gradients with peak amplitude up to 33 mT/m (57 mT/m effective), peak slew rate up to 120 mT/m/ms (208 mT/m/ms effective). All specifications are on axis (x, y and z).
- Superb linearity (< 1.4% over 50 cm FOV) to improve geometric and diffusion accuracy, and to maximize resolution, even at the edges of the field-of-view.
- State-of-the-art water-cooled gradient coil and solid-state amplifier for high fidelity and 100% duty cycle.
- Non-resonant gradient design allows flexible generation of any type of gradient waveform.
- The integrated force-balanced design of the gradient coil and magnet reduces vibrations and ensures acoustic noise is minimized.
- Extremely low eddy currents for short echo times
- AutoSoFTone further reduces gradient acoustic noise by up to 30 dB (an 86 % reduction in patient-perceived acoustic noise).

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## RF receive: DirectDigital and EasyExpand

DirectDigital: Unique Philips technology that samples the MR signal directly in the RF coil on the patient. The fiber-optic transmission of digital broadband data from the coil to the image reconstructor removes potential noise influences typical with analog pathways.

- Capturing the purest MR signal with up to 40% greater signal-to-noise, enabling higher speed/resolution
- Increased dynamic range (max 187 dB)

DirectDigital technology additionally includes:

- Sub-millisecond TRs and ultra-short TEs
- Real-time imaging control for clinical motion correction:
- navigator-corrections required for free-breathing cardiac techniques
- high-resolution diffusion (i.e., PhaseTrak) with profile updates within 1 ms.
- Real-time control of RF transmission, gradient switching, data acquisition and triggering.

EasyExpand: Inherent design of the dStream architecture, where channels are determined by the coils rather than the system. The MR system becomes channel independent, which means a removal of the number of channels as a system specification. This enables plug-and-play expansion of clinical capabilities.

- Expansion does not require major system upgrades, resulting in lower life cycle costs.

## dS-SENSE

Next generation parallel imaging for the dStream (dS) architecture, which simplifies and speeds up scan setup and enables higher parallel imaging factors for more speed or resolution.

- Includes quick, fully integrated reference scans which are planned automatically.

## RF transmit

- 18 kW Solid-state RF power amplifier that provides ample energy to image large patients.
- RF-SMART technology enables SAR to be effectively managed through balanced system design, and maximizes scanner performance in combination with the application of Philips-unique imaging capabilities such as SENSE, SPAIR, Flip Angle Sweep and RF amplitude control.

## Standard RF receive coils

### dS T/R System Body coil 1.5T

The integrated dS T/R System Body coil is a transmit/receive system coil which is typically used for RF excitation, but can also be used for imaging various (large) body parts.

- Solid-state quadrature Transmit/Receive technology for improved SAR control and a high signal-to-noise ratio
- DirectDigital sampling in the coil where the MR signal is at its purest
- Excellent homogeneity
- 70 cm aperture

## dS coil solutions

dStream (dS) coil solutions provide a full range of clinical solutions with two types of coils:

- Integrated coils combine to provide solutions for multiple applications

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- Dedicated coils optimize imaging for a single application

dS coil solutions have been optimized for 3 important characteristics:

- Intrinsic signal-to-noise ratio (DirectDigital)
- Imaging coverage
- Parallel imaging performance

#### **dStream Interface**

Allows the connection and digitization of the signal from traditional RF coils\* at the table. The digital signal from the interface is transferred via an optical connection to the reconstructor.

- Connector interface designed for easy connection and automatic release of coil
- Connects traditional coils up to 16 channels

\*Note: Achieva coils are not compatible with dStream interface

#### **Workflow / throughput: FlexStream**

FlexStream is hinged upon the unique FlexCoverage Posterior coil that provides neck-to-toe coverage without the need for any manual coil removal or patient repositioning. The FlexCoverage Posterior coil simply combines with other unique dS coils to enable imaging with fewer coils and reduce concerns for coil positioning and patient setup. The optional FlexTrak patient transport system enables easy patient preparation and more efficient use of the MR scanner. FlexTrak solutions can instantly convert your MR system from general purpose use to dedicated advanced clinical use, such as breast imaging, intervention or therapy applications, while ensuring high throughput.

- As much as 30% improvement in throughput
- Easy coil handling through lightweight patient conforming coil design
- Large coverage coils for easier positioning
- Flexible combinations of coils
- Efficient coil usage – more applications with fewer coils
- Unique design allows up to 70% of routine applications without additional coil connections.
- FlexConnect easy to use, single-handed coil connections.

#### **FlexCoverage Posterior coil**

Posterior coil, used routinely in 60% of all applications, is an integrated coil below the thin table top providing neck-to-toe coverage. This coil does not need to be carried, positioned, connected nor exchanged, thereby enhancing workflow. It is always there when you need it.

- Head-to-toe coverage up to 200 cm\* in combination with the base coil
- FlexConnect coil connection / connectors:

Single-handed coil connection for fast and easy plugging and unplugging of coils, and for auto-eject with FlexTrak undocking in emergency cases.

The small FlexConnect connectors use advanced fiber-optic connections for carrying digital broadband MR signals.

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- Enhanced reliability by eliminating delicate RF pin connections.

#### **FlexTrak table top**

Ultra-thin table top that maximizes bore space. Includes coil connections directly on the table top for fast and easy setup.

- Ultra-thin design ensures minimal distance between patient and FlexCoverage Posterior coil for optimal SNR
- Ultra-strong design supports patients up to 250 kg (550 lbs)
- Wide table for enhanced patient space and comfort
- Easily removed for patient transport using the optional FlexTrak patient transport system

#### **Workflow / throughput: SmartAssist**

Next generation, easy-to-use SmartExam and ExamCards software that helps the user reduce the number of manual tasks.

- Simplifies workflow by making ExamCards more efficient
- Can reduce repetitive tasks by half
- Increases efficiency, reproducibility and consistency

#### **ExamCards**

A grouping of individual sequences and operations that define a clinical protocol. An ExamCard can include both the imaging sequences and any of the SmartAssist functionalities. ExamCards makes even the most complex exams simple.

- A set of Philips defined ExamCards is standard
- User-defined ExamCards can be created and stored
- Can be exported to memory stick or portable device
- Can be locked with a password to prevent unintended changes
- Can be shared among any of your scanners
- Philips Netforum provides an online community that allows ExamCards to be shared and downloaded
- Supports user-editable tips and processing/viewing/networking steps
- Supports single mouse-click scanner operation

#### **SmartStart**

One button action that automatically moves the table to isocenter and starts the ExamCard while the operator walks back to the console reducing the setup time.

SmartSelect coil and element selection

Automatically detects and selects the right coil and coil elements to maximize the SNR matching the area to be scanned.

- Simplifies patient positioning and coil placement
- No need for manual coil or element selection
- Optimal SNR
- Facilitates higher throughput

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### SmartExam planning (optional)

Assists the operator in planning the MR exam. SmartExam uses sophisticated algorithms to recognize the anatomy. Then, using previously run exams as input, SmartExam automatically positions slices on the target anatomy, and uses ExamCards to conduct the study, reducing operator input to as little as a single mouse click.

- Targeted for 100% reproducibility and consistency in outcome

SmartExam optional packages include:

- SmartExam Brain
- SmartExam Spine
- SmartExam Shoulder
- SmartExam Knee
- SmartExam Breast

### SmartLink geometry linking

SmartLink (geolink) is a tool for simplifying the planning, viewing and processing of multi-sequence multi-station exams, treating multi-station exams as one volume.

- Allows a single table sweep for multi-sequence (e.g. T1, T2, STIR) multi-station exams. All sequences are run at each station before the table is moved to the next station minimizing the number of table movements for increased patient comfort.
- Provides the flexibility to perform one sequence at all stations before starting the next sequence.
- Labels and sorts images regardless of the order in which they are acquired for subsequent viewing and processing as a single volume.
- BolusTrak (fluoroscopic scans) can be interleaved at any point during a multi-station exam.

### SmartLine processing

Smart, automated and intelligent processing of image data. SmartLine processing steps can be run simultaneously and in parallel with image acquisition. Defined in the ExamCard, the same processing settings are used every time for consistent results.

- Progress of each processing step is clearly displayed to the user alongside the scanning progress.

The following packages are included:

- **SmartLine** VolumeView Real-time MIP, MPR and 3D surface rendering (standard or user defined volumes of interest enable elimination of unwanted signals regions)
- **SmartLine** ImageAlgebra (including addition, subtraction, relative subtraction, cumulation, ratios, MTC, ASL calculation)
- **SmartLine** PicturePlus for user-defined image filtering (smoothing and/or edge enhancement)
- **SmartLine** T1 / T2 / rho map calculation
- **SmartLine** Delayed Reconstruction enables various retrospective image reconstructions from raw data (e.g. reconstruction of various flow directions from a 3D phase -contrast MRA dataset)



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Scantools dependent options:

- **SmartLine** Diffusion registration
- **SmartLine** Diffusion (ADC, eADC, etc.)
- **SmartLine** IViewBold real-time fMRI analysis

### Viewing, filming and export

The MR viewing environment supports fast and flexible viewing, processing and film generation

- Window width/level, zoom, pan, rotate, mirror
- Image annotation (text, arrows and lines)
- Simultaneous visualization of up to four independent series for comparison.
- Cine movie display in various formats
- Drag & drop functionality to enable the creation of films containing random image selections
- Single mouse click film generation of image series using a range of predefined formats
- Images and movies can be exported to Windows PC formats as visible on screen

### Patient environment and patient handling

The Ingenia was designed with the patient in mind, no matter the age, size or physical condition. The Ingenia's patient environment and patient handling features enhance patient comfort and facilitate exams.

Important features:

- Lightweight, patient-conforming coils
- 70 cm bore and extra large FOV imaging space
- Digital coil management workflow
- DirectDigital RF technology digitizes the signal in the RF coil on the patient
- SmartAssist efficiency enhancing software

Benefits include:

- More comfortable exams
- Decreased need for coil positioning
- Fewer retakes
- Faster exams

### Patient Comfort

- 70 cm aperture for enhanced patient comfort, patient fit and reduced anxiety
- Choice of feet-first or head-first imaging for most applications
- FlexCoverage Posterior coil: Never worry about the position of the patient to this coil. No cables, no connections. This invisible, patient-friendly coil is always there when you need it.
- Lightweight, conforming coils for enhanced patient comfort and operator handling
- Ambient Ring circular light to enhance the visual openness of the system.
- Adjustable fresh air supply in 6 increments
- Adjustable variable in-bore lighting in 3 increments

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- In-bore microphone and ceiling-mounted loudspeakers support two-way patient-operator communication and music.
- Hand-held technologist call button.
- Patient headset with built-in two-way communication reduces acoustic noise by up to 25 dB.
- Look-out mirror with adjustable angulation

#### **Patient support**

- Patient support enables patients weighing up to 250 kg (550 lbs) to be comfortably positioned and lifted.
- Wide table top for improved patient comfort and accommodation of larger patients
- Patient table height can be quickly lowered, providing access for compromised or non-ambulatory patients.
- Detachable tabletop can be combined with one or more FlexTrak patient transport systems for efficient patient management and rapid egress. Supported by manual mode table release.
- Up to 200 cm\* scan range
- Horizontal travel of 275 cm (9 ft 1 in.) with +/- 0.5 mm (0.02 inch) accuracy
- Horizontal table speeds of up to 325 mm/s to enable fast, easy patient positioning and rapid multi-station examinations
- Ergonomically designed control units on both sides of the bore to increase operating flexibility.

#### **Physiology measurement and gating**

Wireless physiological hardware to provide synchronization for sequence triggering and gating. Wireless physiological signals can be observed on the operator's console monitor or on the optional Interventional Monitor.

- Wireless Physiology consisting of wireless Basic Triggering Unit (wBTU) and respiratory module hardware
- Physiological synchronization for sequence triggering and gating through
  - Wireless VCG
  - Wireless Respiratory
  - Wireless PPU (requires optional PPU Sensors)

#### **Patient accessories**

Comprehensive set of patient accessories, including

- Table mattress set
- Head/leg support
- Knee support
- Positioning wedges
- Small foam wedges
- Set of sandbags
- Set of patient fixation straps

#### **Computer specifications (may be supplied on one or two computers)**

##### **Host**

- >= 32 GB host memory
- >= 100GB system disk

Line #	Description	Qty
	<ul style="list-style-type: none"> <li>• &gt;= 250 GB main image database disk (Approx. &gt;= 300,000 images – 256 x 256 image resolution)</li> <li>• &gt;= 23-inch LCD wide-screen format monitor enabling large overview</li> <li>• LCD wide screen resolution: 1920 x 1200</li> <li>• MicroSoft Windows ® OS 64 bits</li> <li>• External storage via USB port</li> <li>• 10BaseT, 100BaseT or 1000BaseT connections.</li> </ul>	

#### Recon

- Fast reconstruction of demanding imaging techniques (interactive real-time, dS-SENSE, high resolution and high coil receiver count).
- >= 6000 images per second (256 x 256 reconstructions)
- >= 13000 recons/sec (256 FFT, 100% FOV)
- >= 32 GB reconstruction memory (RAM)

#### Connectivity / interoperability

The MR environment fits seamlessly into local network environments. Communication is performed via DICOM protocols. The system can be configured for safe storage of MR images and other patient data in departmental information systems and PACS. The MR workspace conforms to the new Enhanced (multi-frame) MR DICOM standard, which improves the performance of data transfer of large data sets and fully supports information associated with diffusion and spectroscopy.

The system can be configured (per node) to support standard DICOM MR image transfer or DICOM Enhanced MR Image Transfer. If a receiving node does not support DICOM Enhanced MR, standard DICOM MR Images will be transferred.

- DICOM Workflow Management:
  - DICOM Modality Worklist
  - DICOM Modality Performed Procedure Steps
  - DICOM Storage Commitment
- DICOM Send/Receive:
  - DICOM Enhanced MR:
    - Export / Import of DICOM Enhanced MR Images
    - Export / Import of DICOM MR Spectroscopy
    - Export / Import of DICOM Raw
  - DICOM MR:
    - Export / Import of DICOM MR Images
    - Export / Import of Philips Private MR Series Data
    - Export / Import of Philips Private MR Spectrum Data
    - Export / Import of Philips Private MR ExamCards Data
  - DICOM SC:
    - Export / Import of SC (color) Image Data
  - DICOM Grayscale Softcopy Presentation State:
    - Export / Import of Grayscale Softcopy Presentation State
- DICOM Query / Retrieve of Philips MR data, all the exported image types
- DICOM Print
  - Grayscale Softcopy Presentation State with preset window settings as on the console
  - Basic Grayscale Print

Line #	Description	Qty
	<ul style="list-style-type: none"> <li>DICOM Media <ul style="list-style-type: none"> <li>MR Studies on DVD (Read / Write)</li> </ul> </li> <li>IHE Integration Profiles <ul style="list-style-type: none"> <li>Scheduled Workflow</li> <li>Patient Information Reconciliation</li> <li>Consistent Presentation of Images</li> <li>Basic Security</li> <li>Consistent Time</li> </ul> </li> </ul>	

Full information on compliance with DICOM standards and available functionality is contained in Philips' DICOM Conformance Statement.

### **Installation: EasySite and PowerSave**

#### **EasySite**

System design for rapid installation times, compact siting footprint and low ceiling heights.

- Installation times as short as 7 days, based on prepared site conditions.
- Industry's lightest wide-bore magnet enables siting on upper floors.
- Siting (exam/technical/control room) as little as 27 m2.
- Low ceiling height
- Low transport height for easy facility access
- System / building vibration transfer is minimized by special vibration pads that require no facility adaptations.

#### **PowerSave**

Unique, efficient design combined with smart power management of the high power sub-systems (gradient amplifiers, RF amplifiers, etc.) enable reduction in power consumption by up to 50% without affecting overall performance.

#### **Scantools PRO**

Scantools Pro provides the following generic workflow features for all clinical anatomies:

- ExamCards, for automated scanning and processing of patient studies. Examcards can be edited during scanning. The Split Exam option provides you the ability to separate imaging series acquired during a single scan session into multiple scan instances. This allows for correct association of imaging series to ordered/scheduled examinations to facilitate proper reporting, data handling and billing activities.
- SENSE parallel imaging methods for fast scan times, high resolution or to reduce susceptibility artifacts.
- CLEAR for signal uniformity correction based on coil-sensitivity and on patient loading.
- PicturePlus to improve appearance of images through edge enhancement and smoothing. Provides full control over all enhancement parameters, which can be applied automatically post-acquisition or as a post-processing option.
- High-resolution acquisitions and reconstruction (1024 matrix)

In addition, ScanTools Pro contains fast, high resolution imaging methods for the assessment of morphology of all anatomical areas including brain and spine, MSK, body and breast, cardiac, and

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various blood vessels with or without contrast agents. Specific features per clinical area are listed below.

#### Neuro Pro

- Sequences include SE, FFE and EPI based methods, with fat suppression methods including STIR, SPIR, ProSet and SPAIR.
- FLAIR for CSF suppression.
- Snapshot imaging, intended for uncooperative patients, eliminates the effects of patient and physiological motion through the combination of rapid TSE sequences and SENSE. Individual Snapshot images can be acquired in any orientation in approximately 250ms to 300ms. Asymmetric TSE makes Snapshot compatible with T1-, T2- and diffusion-weighted imaging.
- Single, Dual and Triple IR sequences for evaluation of gray and white matter differentiation.
- 2D TSE with Flip Angle Sweep technology for SAR and Magnetization Transfer reduction, improving gray/white matter contrast in both T2 and FLAIR acquisitions.
- 3D based anatomical sequences including:
  - VISTA, isotropic 3D TSE for volumetric acquisitions with reconstruction in any plane.
  - 3D T1-TFE sequences for volumetric acquisition and reconstruction of the original dataset in any orientation.
  - 3D TFE for isotropic coverage of the entire head in short scantimes using SENSE. A single data set can be reformatted into alternate planes both pre- and post-contrast, eliminating the need for additional scans.
- DRIVE for T2-weighted 2D and 3D TSE acquisitions enabling short TRs while maintaining contrast-to-noise and SNR. Used to improve fluid visualization (IAC), for short scan times and to increase resolution.
- Balanced FFE/TFE for high-resolution high contrast (IAC and Spine applications).
- ProSet water and fat excitation for spinal nerve root imaging. Combines the characteristics of the high-resolution volume acquisitions with ProSet water or fat only selection.
- Multiple radial projection myelography both with 2D and 3D sequences.
- MultiVane to correct motion for multi-shot TSE examinations with radial encoding. MultiVane delivers high resolution diagnostic images even in case of patient motion for T2, IR-real & FLAIR TSE imaging as well as gradient-echo examinations.
- Dynamic multi-slice T2\*-weighted sequences based on single- or multi-shot FFE-EPI methods for perfusion and fMRI sequences.
- Single-shot EPI diffusion-weighted imaging (DWI) with three diffusion directions and up to 16 b-values, robust against motion and generating isotropic DWI images.
- BolusTrak enables accurate synchronization of high-resolution CE-MRA acquisitions. BolusTrak uses a real-time fluoroscopic display of bolus arrival in the area of interest and manual start of the target acquisition. BolusTrak in combination with CENTRA minimizes venous contamination and produces optimal arterial vessel contrast and resolution.
- TRACS enables accelerated time-resolved contrast-enhanced vascular imaging. TRACS uses SENSE for image acceleration and CENTRA phase-encode ordering for optimized contrast.
- m-FFE provides unique image contrast - ranging from 2D or 3D gradient-echo sequences to the combination of echoes.
- Venous BOLD provides T2\*-weighted 3D sequences compatible with SENSE. These sequences are useful for evaluating various brain anomalies associated with venous blood.
- Phase contrast (PC) sensitive imaging for the visualization of moving fluids.
- MobiFlex and MobiView, compatible with all sequences, for easy Total Spine imaging.
- T2\* perfusion analysis.
- Diffusion imaging processing with automatic generation of the ADC maps.

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	<ul style="list-style-type: none"> <li>Perfusion tools package, enabling: <ul style="list-style-type: none"> <li>Dynamic multi-slice T2*-weighted sequences based on single- or multi-shot FFE or FFE EPI methods, including the PRESTO technique.</li> <li>Processing and calculation of T1 and T2* hemodynamic maps including Mean Transit Time (MTT), Time to Peak (TTP), Time of Arrival (TO), Negative Integral (NI), Index or upslope. All post-processing can be included as an in-line step within Examcard</li> <li>Prospective Motion Correction: accounts for subject motion by real time monitoring of motion during acquisition and adjustment of acquisition parameters accordingly. PMC enables overall improvements in image registration.</li> </ul> </li> <li>3D PRESTO <ul style="list-style-type: none"> <li>Whole brain coverage and high temporal-resolution T2*-weighted imaging for perfusion-weighted and BOLD imaging studies.</li> <li>Higher temporal resolution and coverage compared to traditional multi-slice techniques.</li> <li>Reduce sensitivity to susceptibility and flow artifacts associated with EPI techniques, enabling imaging throughout the brain and into the skull base.</li> </ul> </li> </ul>	

### MSK Pro

- SE, TSE, and FFE sequences, with fat suppression provided by STIR, ProSet, SPIR and adjustable fat suppression with the SPAIR method.
- Balanced acquisitions (bFFE) for high-resolution morphology scans.
- DRIVE combined with TSE to increase sensitivity to fluids (with good T2 weighting), even with short TRs.
- Turbo-STIR for fat-suppressed evaluation of bone bruises.
- TSE with asymmetric profile ordering for proton density weighted imaging of joints with higher spatial resolution or faster scan times.
- Mixed Mode (interleaved IR/SE for combined T1 & T2 map calculation).
- Multi-Echo T2 measurements (up to 32 echoes) for T2 mapping.
- 3D FFE with ProSet for water-only (selective excitation) sequences. Optimizes cartilage and/or fluid imaging with high-resolution in all directions.
- e-THRIVE for 3D high-resolution fat-suppressed imaging for MR arthrograms and evaluation of soft tissue lesions as well as rheumatoid arthritis.
- MobiFlex for simple visualization of total spine imaging and multiple-station long bone studies.
- Dynamic imaging sequences for TMJ or other joint studies.
- Includes protocols for imaging in the presence of prostheses, with improved susceptibility using SENSE, modifications of water-fat shift and user-specified bandwidth.
- Up to 1024 acquisition resolution and flexible reconstruction resolution via interpolation.

### Body Pro

- TSE sequences with respiratory triggering (in combination with breath hold or free breathing).
- MultiVane motion correction for T2w TSE diagnostic images, even in case of severe patient motion.
- In and out of phase FFE/TFE sequences.
- SPAIR for high uniformity fat saturation.
- e-THRIVE volumetric imaging with fat suppression, in short breath-hold times Keyhole for high temporal dynamic imaging.

Line #	Description	Qty
	<ul style="list-style-type: none"> <li>• Diffusion-weighted sequences with automated creation of Apparent Diffusion Coefficient (ADC) maps.</li> <li>• MRCP sequences, (radial) single shot and 3D acquisitions.</li> <li>• High-resolution pelvic imaging.</li> <li>• VISTA: isotropic 3D TSE pelvic imaging allowing volumetric acquisitions to be reconstructed in any plane.</li> <li>• MobiView and MobiFlex for automatic composition of data sets from multi-station acquisitions into full FOV images.</li> <li>• Dynamic scan techniques for monitoring and evaluation of contrast uptake viewing.</li> <li>• High Resolution Diffusion / DWIBS package enables single or multi-station high resolution diffusion weighted imaging with background suppression. Patient and physiological motion is controlled by navigator-based motion correction.</li> <li>• MotionTrak Body includes a real-time respiratory navigator to synchronize data acquisition to the respiratory cycle of the patient. Options include: gating, tracking, gating &amp; tracking, triggering, triggering &amp; tracking. Tracking improves slice accuracy position over multiple breath hold sequences. Designed for all Body applications, including diffusion and DWIBS.</li> </ul>	

### Breast Pro

- SPAIR for high uniformity fat saturation.
- e-THRIVE for volumetric coverage with uniform fat suppression.
- BLISS, two bilateral sagittal volumes within a single acquisition.
- Diffusion-weighted sequences with automated creation of Apparent Diffusion Coefficient (ADC) maps.
- Silicone-Only sequences optimized for breast implants.

### Cardiac Pro

- Black blood prepulses to suppress blood signal for optimized myocardial and lumen visualization.
- Multi Slice / Multi Phase for function studies.
- Retrospective triggering with real-time prospective updating for full R-to-R coverage of function studies.
- Temporal profile sharing for playback frame rates higher than acquisition frame rates.
- VCG gating for robust ECG gating and triggering (includes a four-lead cable set).
- ECG-triggered STIR (inversion recovery TSE) including black blood imaging (triple IR)
- ECG-triggered Inversion Recovery (including PSIR) for myocardial tissue characterization.
- Non-invasive quantitative flow measurements of blood, including overlaid color-encoded flow maps on the console.

### MRA Pro

- 3D FFE sequences for contrast-enhanced MRA, including assessment of carotids, peripherals and renal arteries.
- Quantitative flow with variable VENC values for non-invasive measurements of blood flow in three directions.
- 2D/3D Balanced TFE/FFE for fast, high-resolution non-contrast enhanced vascular imaging.
- Phase-Contrast Angio for imaging of brain vasculature.
- TRANCE for 3D high contrast TSE acquisitions without vascular contrast agents.

Line #	Description	Qty
	<ul style="list-style-type: none"> <li>• Time-of-flight (inflow) sequences with TONE to improve contrast and MTC to reduce peri-orbital fat signal.</li> <li>• CENTRA for 3D high-resolution contrast enhanced imaging to allow an increase in spatial resolution without venous contamination.</li> <li>• Keyhole imaging to improve temporal resolution in dynamic studies.</li> <li>• BolusTrak for synchronization of high-resolution CE-MRA acquisitions with a real-time fluoroscopic display of bolus arrival in the area of interest.</li> <li>• MobiView for automated composition of multi-station acquisitions (e.g. MRA runoffs) into single images.</li> <li>• MobiFlex for setup and acquisition of complex multi-station exams, combining different FOVs, resolution, geometries and SENSE acceleration factors.</li> <li>• VCG gating for robust ECG gating and triggering (includes a four-lead cable set).</li> </ul>	

## dS PerformanceSuite

### Towards first time right imaging

The dS PerformanceSuite is designed for fast workflow, robust scanning and an enhanced patient experience during MRI examinations. The toolset is powered by our dStream broadband architecture for digital quality and speed. It delivers innovative artifact reduction methods, including mDIXON XD TSE for fat free imaging, supporting 30% faster scanning. The suite also incorporates automated imaging protocols, including SmartExam that help deliver reproducible results. This means technologists spend less time on scan set-up and have more time to dedicate to patient care. What's more, our innovative Patient In-Bore\* solutions enhance the patient experience and help make the MRI exam as comfortable as possible.

*\*Described as AutoVoice, ComforTone, In-bore Connect software. Ambient Experience Patient In-Bore solution is available as an option*

The dS PerformanceSuite includes:

- Patient in-bore Solutions
- Technologists Solutions
- Fast and robust imaging

### Patient In-bore Solutions

#### AutoVoice - Guiding your patients through the MR examination

AutoVoice is a fully integrated and automated solution that guides your patients through the MR examination by indicating scan duration, announcing table movements and providing breathhold guidance, helping you enhance patient comfort.

#### ComforTone - Reduce acoustic noise and enhance MR patient experience

Leveraging our years of experience in acoustic noise reduction technologies, our unique ComforTone solution achieves up to 80% acoustic noise reduction\* with similar image quality and contrast within the same time slot.

*\*Compared to scanning without ComforTone*

#### In-bore Connect enabled

MR software enabling the communication with Ambient Experience Patient in-Bore Solution.

### Technologists Solutions



Line #	Description	Qty
	<b>ScanWise Implant - A key to confidence with MR Conditional implants</b> ScanWise Implant software helps you to confidently scan patients within the MR Conditional limits by providing step-by-step guidance to enter the condition values of the implant manufacturer. Your MR system then automatically applies these values for the entire examination helping you to simplify your scanning process for patients with MR Conditional implants.	
	<b>Fast and robust imaging</b>	
	<b>SmartExam Brain - Standardized exams for consistent MRI results</b> SmartExam Brain* assists in delivering reproducible planning results in more than 80% of procedures by using intelligent software which automatically plans the scanning geometries, based on your validated scanning preferences. This enables you to standardize your MRI exam process helping you to enhance consistency in follow-up exams of the same patient and from patient to patient. <i>*SmartExam is not available to patients with MR Conditional Implants</i>	
	<b>SmartExam Spine - Standardized exams for consistent MRI results</b> SmartExam Spine* assists in delivering reproducible planning results in more than 80% of procedures by using intelligent software which automatically plans the scanning geometries, based on your validated scanning preferences. This enables you to standardize your MRI exam process helping you to enhance consistency in follow-up exams of the same patient and from patient to patient. <i>*SmartExam is not available to patients with MR Conditional Implants</i>	
	<b>SmartExam Knee - Standardized exams for consistent MRI results</b> SmartExam Knee* assists in delivering reproducible planning results in more than 80% of procedures by using intelligent software which automatically plans the scanning geometries, based on your validated scanning preferences. This enables you to standardize your MRI exam process helping you to enhance consistency in follow-up exams of the same patient and from patient to patient. <i>*SmartExam is not available to patients with MR Conditional implants.</i>	
	<b>SmartExam Shoulder - Standardized exams for consistent MRI results</b> SmartExam Shoulder* assists in delivering reproducible planning results in more than 80% of procedures by using intelligent software which automatically plans the scanning geometries, based on your validated scanning preferences. This enables you to standardize your MRI exam process helping you to enhance consistency in follow-up exams of the same patient and from patient to patient. <i>*SmartExam is not available to patients with MR Conditional implants</i>	
	<b>SmartExam Breast – Consistent fat suppression for every patient</b> SmartExam Breast* provides consistent fat suppression for every patient and assists in delivering reproducible planning results by using intelligent software which automatically plans the scanning geometries, based on your validated scanning preferences. This enables you to standardize your MRI exam process helping you to enhance consistency in follow-up exams of the same patient and from patient to patient. <i>*SmartExam is not available to patients with MR Conditional Implants.</i>	
	<b>MultiVane XD - Motion-free imaging in short scan time</b> MultiVane XD delivers high-resolution diagnostic images even in the case of severe patient motion by providing motion correction to a full range of anatomies, in short scan times*. MultiVane XD works in multiple orientations and for various contrasts (T1w, T2w, FLAIR) helping you to increase your diagnostic confidence. <i>*Compared to Multivane, thanks to compatibility with dS SENSE</i>	

Line #	Description	Qty
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### **3D Vane XD - Free breathing abdominal imaging**

3D VANE XD supports imaging of the abdomen without the need for the patient to hold their breath, helping you reduce motion artifacts during free breathing\* and improve patient comfort. With 3D VANE XD, you can now accommodate patients who are unable to hold their breath, including pediatric patients.

*\*Due to radial imaging method, compared to Philips 3D cartesian imaging method*

### **mDIXON XD TSE Specialist - Replace all your FatSat by one single fat-free imaging solution**

mDIXON XD TSE brings a new dimension to fat suppression by providing uniform, complete and consistent fat-free imaging, even over large field-of-views and in challenging anatomies. Providing up to four image types in one single scan, including with/without fat suppression contrasts, in routine scan times and resolution simultaneously, you can easily replace your favorite routine TSE scans with it. mDIXON XD TSE will enable you to enhance your imaging strategies by simplifying your routine TSE procedures.

### **mDIXON XD FFE Specialist - Improve your fat-free imaging performance**

mDIXON XD FFE provides more efficient fat-free imaging in routine scan times. Improve your fat-free imaging over large field-of-views and for high-resolution imaging. With up to four image types in one single scan, including with or without fat suppression contrasts, mDIXON XD FFE will enable you to enhance your imaging strategies by simplifying your routine FFE procedures.

### **O-MAR - Efficient near-metal soft tissue and bone imaging**

O-MAR (Metal Artifact Reduction for Orthopedic implants) allows you to improve visualization of more soft tissue and bone in the near vicinity of MR Conditional orthopedic implants\*. This allows you to offer post-operative MR imaging to patients with implants who could develop implant-related conditions. O-MAR offers a reduction of in-plane susceptibility artifacts caused by metal implants.\*\* It is extending MARS (Metal Artifact Reduction Sequence) with the View Angle Tilting (VAT) technique.

*\*Only for use with MR Safe or MR Conditional implants by strictly following the Instructions for Use.*

*\*\*Compared to standard high bandwidth spin-echo based techniques.*

### **Whole Body Specialist - Get comfortable body imaging with head-to-toe coverage**

Whole Body package supports automated head-to toe imaging coverage. By allowing an extended table stroke, it enables whole-body, multi-station, feet first imaging studies. You can perform all required imaging sequences per station, reducing the amount of required table movements.

## **dS NeuroSuite Plus**

Neurological disorders represent a heavy burden in today's society.\* Leveraging our dStream digital platform, Philips imaging and visualization strategies for neurology provides high-quality images at remarkable speed. As a result, you can view multi-dimensional data to aid your diagnostic decisions. With techniques like SWI Specialist, our rich portfolio helps you address growing demands in neuro imaging.

*\*Neurological Disorders: Public Health Challenges. WHO. 2006*

The dS **NeuroSuite Plus** includes:

- 3D BrainVIEW
- 3D SpineVIEW
- SWI Specialist

Line #	Description	Qty
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### **3D BrainVIEW - View your 3D TSE imaging data in any plane**

3D BrainVIEW is an advanced 3D TSE technique that lets you acquire high-resolution data in multiple directions, including oblique, in one scan helping you enhance your confidence when diagnosing lesions.

### **3D Spine VIEW - View your 3D TSE imaging data in any plane**

3D SpineVIEW is an advanced 3D TSE technique that lets you acquire high-resolution data in multiple directions, including oblique, in one scan helping you enhance your confidence when diagnosing lesions.

### **SWI Specialist - Exquisite susceptibility contrast**

SWIp has a high sensitivity to enhance contrast for deoxygenated (venous) blood or calcium deposits and may help you, when used in combination with other clinical information, in the diagnosis of various neurological pathologies. SWIp offers high resolution 3D susceptibility weighted brain imaging allowing you to easily integrate it into your mainstream practice.

### **.dS MSKSuite**

With ageing population, dedicated applications for specific anatomies and solutions for patients with implants, the dS **MSKSuite** helps you enhance quality while making MR accessible to more people. Powered by our dStream digital broadband architecture, which provides highquality images at remarkable speed, 3D MSK VIEW delivers superb visualization of soft tissue and bone, helping you capture a wealth of structural and physiological information. Philips' MSK-diagnostic applications helps you find answers to your most challenging MSK cases.

The dS **MSKSuite** includes:

- 3D MSK VIEW
- 2k imaging
- O-MAR XD Specialist

### **3D MSK VIEW - View your 3D TSE imaging data in any plane**

3D VIEW is an advanced 3D TSE technique that lets you acquire high resolution data in multiple directions, including oblique, in one scan helping you enhance your confidence when diagnosing lesions.

### **2k imaging**

2k Imaging offers a scan matrix of 2048 x 2048, providing high resolution even with large FOVs, or lower resolution scans with a 2048 matrix reconstruction. Compatible with all imaging methods.

### **O-MAR XD Specialist - Efficient near-metal soft tissue and bone imaging**

O-MAR XD (Metal Artifact Reduction for Orthopedic implants) allows you to improve visualization of more soft tissue and bone in the near vicinity of MR Conditional orthopedic implants.\* This allows you to offer postoperative MR imaging to patients with implants who could develop implant-related conditions. O-MAR XD offers a reduction of in-plane and through-plane susceptibility artifacts caused by metal implants.\*\* It is extending MARS (Metal Artifact Reduction Sequence) with the View Angle Tilting (VAT) and Slice Encoding for Metal Artifact Correction (SEMAC) techniques.

*\*Only for use with MR Safe or MR Conditional implants by strictly following the Instructions for Use. \*\*Compared to standard high bandwidth spin-echo based techniques.*

### **Head Neck Spine coil package**

Line #	Description	Qty
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#### **dS TotalSpine 1.5T**

An integrated coil solution for total spine related imaging. It includes the FlexCoverage Posterior and the Base coil with 90 cm coverage, using 44 channels maximum. Posterior coil, used routinely in 60% of all applications, is an integrated coil below the thin table top providing neck-to- toe coverage. This coil does not need to be carried, positioned, connected nor exchanged, thereby enhancing workflow. It is always there when you need it.

- Coverage: 90 cm
- Maximum nr. of channels: 44
- Main applications: Total spine, C-Spine, T-Spine, L-Spine
- Coil type: Integrated
- DirectDigital sampling in the coil where the MR signal is at its purest, without loss in the RF chain, enabling:
- Enhanced SNR
- dS-SENSE enhanced parallel imaging performance
- Single FlexConnect coil connection and cable for fast and easy setup
- The Base coil can stay on the table for most examinations without exchanging coils

#### **dS HeadNeckSpine 1.5T**

An integrated coil solution for head, neck and total neuro related imaging. It includes the HeadNeck coil. Combined with the FlexCoverage Posterior coil and Base it enables:

- 45 cm coverage, using 20 channels maximum (Head-Neck)
- 90 cm coverage, using 52 channels maximum (Total Neuro)
- Coverage: 45 cm (HeadNeck) and 90 cm (Total Neuro)
- Maximum nr. of channels: 20 (HeadNeck) and 52 (Total Neuro)
- Main applications: NeuroVascular, Head, Brain, Pediatric, Total Neuro, Total spine, C-Spine, T-Spine, L-Spine
- Coil type: Integrated
- Lightweight coil(s)
- DirectDigital sampling in the coil for the purest MR signal without loss in the RF chain, enabling:
- Enhanced SNR
- dS-SENSE enhanced parallel imaging performance
- dS-SENSE capable in AP, LR and FH directions
- Cable-less connection of top coil

When used with an Ingenia, the head section can be tilted to provide optimal positioning and comfort for challenging patients such as Kyphosis patients. Note: this feature is only available with an Ingenia 70cm bore system.

#### **dS Head 1.5T**

An integrated coil solution for head and total neuro related imaging. It includes the Head top coil, which combined with the FlexCoverage Posterior coil and Base enables:

- 30 cm coverage, using 15 channels maximum (Head)
- 90 cm coverage, using 51 channels maximum (Total Neuro)

Line #	Description	Qty
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When used with an Ingenia, the head section can be tilted to provide optimal positioning and comfort for challenging patients such as Kyphosis patients. Note: this feature is only available with an Ingenia Omega or Ingenia Omega HP.

- Coverage: 30 cm (Head) and 90 cm (Total Neuro)
- Maximum nr. of channels: 15 (Head) and 51 (Total Neuro)
- Main application: Head, Brain, Total Neuro, Total spine, C-Spine, T-Spine, L-Spine
- Coil type: Integrated
- Lightweight coil(s)
- DirectDigital sampling in the coil where the MR signal is at its purest, without loss in the RF chain, enabling:
  - Enhanced SNR
  - dS-SENSE enhanced parallel imaging performance
  - dS-SENSE capable in AP, LR and FH directions
- Cable-less connection of top coil

#### **dS Flex M 1.5T**

An integrated coil solution for general-purpose imaging. It includes two medium-sized flexible general-purpose coils. Combined with the FlexCoverage Posterior coil they enable 15 cm coverage, with a maximum of 6 channels.

The shape and size of the flexible coil elements enable a wide variety of applications, including imaging of medium sized anatomies. The coil can be used to locally enhance resolution of images acquired over a larger FOV, for example in pediatric applications.

- Coverage: 15 cm
- Maximum nr. of channels: 6
- Main applications: Shoulder, Foot, Ankle, Knee, Pediatric
- Coil type: Integrated
- dS-SENSE enhanced parallel imaging performance

#### **dS Torso 1.5T**

An integrated coil solution for body and peripheral vascular related imaging. It includes the FlexCoverage Anterior coil. Combined with the FlexCoverage Posterior coil it enables 60 cm coverage, with a maximum of 32 channels.

The flexible, lightweight easy-to-position FlexCoverage Anterior coil is designed to conform both in right-left and foot-head directions for almost any patient. This enables large coverage and comfortable strap-free operation.

- Coverage: 60 cm
- Maximum nr. of channels: 32
- Main applications: Torso, Chest, Pelvis, Heart, Peripheral-vascular
- Coil type: Integrated
- Lightweight coil(s)
- DirectDigital sampling in the coil where the MR signal is at its purest, without loss in the RF chain, enabling:
  - Enhanced SNR
  - dS-SENSE enhanced parallel imaging performance
  - dS-SENSE capable in AP, LR and FH directions
- Single FlexConnect coil connection and cable for fast and easy setup

Line #	Description	Qty
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#### **PPU for wireless physiology**

The PPU for wireless physiology package contains a peripheral pulse sensor with the following 4 different sizes: neonate, infant, pediatric and adult. This option is required to use the periph pulse as a means to do physiological synchronization for sequence triggering and gating . The sensor can be positioned on finger, toe or foot, and is compatible with the Ingenia, Multiva, HFO and Achieva platforms. This package is ONLY compatible with Ingenia, Achieva, Multiva, and/or Panorama systems with wireless physiology.

#### **Arm support**

The arm support is designed to work in conjunction with the existing MR tabletop to provide additional support for a patients arm when injections are required. The support easily slides under the patient.

Features:

- Transparent arm support contoured to match the MR table-top
- Positioning on either side of table

#### **HA console table**

Standard office table for MR-operator

- Table surface 160x100 cm
- Adjustable Height

#### **DVD-PC**

Local media storage option intended for burning and reading DICOM data on medical grade DVD's. This option enables the operator to burn DVD's directly or prepare multiple DVD's for burning later.

- Includes DICOM viewer on every DVD created
- Create multiple DVD's for exchange with off-line stations
- Burn DVD's independently of other scanner functions.
- Dimensions (hwxwd): 10x34x38cm

If customer orders the system quoted herein, and Philips subsequently begins commercially selling a system that it identifies as a newer version of the same model or a successor replacement model for the model purchased in this quote then at Philips discretion the order may be converted to the identified newer version of the same model system or the successor replacement model in accordance with this paragraph. This conversion can only take place up to, but not after, factory production of the originally ordered system has begun. For purposes of this paragraph, a direct successor system is intended to be a system that offers materially comparable functionality and technology to an ordered system and that is intended to serve as a competitive alternative or successor to the quoted system, provided that (i) it shall be in Philips' sole and exclusive discretion to determine that a system is a new version of the same model or successor replacement system that acts as the sole upgrade path for the order system and (ii) the existence of minor differences in functionality shall not preclude a system from being deemed a newer version of the same model or a successor replacement system. To communicate this option to Customer, Philips shall present a revised quote for Customer approval, which quotation will outline

Line #	Description	Qty
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the substantially similar feature configurations and options as the ordered system, and no change to the system's price, or, if Customer wants to change the configuration or options on the successor system, or avail themselves of additional functionality, then Philips will adjust the quoted price of the successor system.

(a) If the quoted system is not yet in production, to exercise this option, Customer must approve the revised quote prior to production beginning on the ordered system and prior to the deadline provided by Philips at the time of re-quoting. If customer does not approve the revised quote during this period, then Customer will be deemed to have declined the option and this system quotation will continue to apply.

#### **Clinical Education Package for Ingenia S:**

##### **Customer Applications Training \_Introduction to Philips MR Release 5 - Learning Path 1:**

This online pre-learning material will introduce the User Interface and clinical handling of the MR scanner to prepare the technologist for on-site training. Learning Path 1 will guide the technologist through specific workflow steps, this self-paced learning module is highly recommended for all Ingenia users and should be completed prior to Essentials OffSite or Handover Onsite Education. CEU credits may be available for each participant that meets the guidelines provided by Philips.

**Release 5 Essentials OffSite Education:** The MR Release 5 Essential course is a prerequisite to attending the MR Release 5 Advanced Concepts course. Philips will provide up to two (2) technologists, as selected by customer, with in-depth didactic, tutorial, and hands-on training covering basic functionality and work-flow of the magnetic resonance imaging system. This twenty-eight (28) hour class is located in Cleveland, Ohio, and is scheduled based on your equipment configuration and availability. Due to program updates, the number of class hours is subject to change without notice. Customer will be notified of current, total class hours at the time of registration. In order to provide trainees with the ability to apply all fundamental functioning on their system, and to achieve maximum effectiveness, this class should be attended no earlier than two weeks prior to system installation, and trainee should have prior knowledge of basic MR theory. CEU credits may be available for each participant that meets the guidelines provided by Philips.

**Handover OnSite Education:** Philips Education Specialists will provide twenty-eight (28) hours of education for up to four (4) students, as selected by customer. Students should attend all 28 hours, and must include the two OffSite education attendees. This course does not cover Cardiac or Spectroscopy. CEU credits may be available for each participant that meets the guidelines provided by Philips. Please refer to guidelines for more information. Note: Site must be patient-ready, including all inspections approved, all accessory equipment installed and functioning (injectors, hard copy units, film processors and physiologic monitors), and all supplies stocked.

**Note: Philips personnel are not responsible for actual patient contact or operation of equipment during education sessions except to demonstrate proper equipment operation.**

**FollowUp OnSite Education:** Philips Education Specialists will provide two (2) separate twenty-eight (28) hour sessions of Follow-Up Education for up to four (4) students, selected by customer, including technologists from night/weekend shifts if necessary. Customer must have operated the system for at least 30 days. CEU credits may be available for each participant that meets the guidelines provided by Philips. **Note: Philips personnel are not responsible for actual patient contact or operation of equipment during education sessions except to demonstrate proper equipment operation.**

**PLEASE NOTE for all OnSite Education: It is recommended to purchase additional training, 16 or 24 hours, for customers purchasing specialist packages and requiring dedicated training for Breast Imaging, BOLD fMRI, Cardiac or Spectroscopy.**

Line #	Description	Qty
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**Project and Workflow Evaluation:** Philips Education representative(s) conduct an eight (8) hour onsite customer MR Site/Clinical assessment; to include site demographics, workflow, identifying key contact personnel and decision makers. This process includes direct observation of customer's MR department workflow. Additionally, a copy of the Customer's MR protocol list is requested to be made available to Philips Education representative. Customer information provided during this process is the first building block for planning educational support and Clinical Exam Card configuration.

**Implementation Support:** Philips Clinical Education Representative supports the overall implementation of all customer training phases of the MR system handover and continued educational support. A Philips Education Representative works with the customer to design a customized MR education program and coordinate the customer training/education implementation. Implementation support includes all onsite and offsite customer training events.

**Clinical Exam Card Configuration:** Exam Card (MR scan protocol) Configuration process is to ensure the Philips MR system is producing acceptable image quality according to customer preferences. Philips Clinical Education Specialist will provide sixteen (16) hours offline customized MR exam card configuration prior to onsite exam card IQ confirmation. Philips Clinical Education Specialist also conducts sixteen (16) hours onsite MR exam card configuration and image quality confirmation. This process includes Image quality acceptance made by the Customer's designated physician representative. Philips Clinical Education Specialist, working with the Customer Lead Technologist will make requisite adjustments to the exam card database in order to meet the customer's initial image quality expectations. Note: Philips personnel are not responsible for actual patient contact or operation of equipment during education sessions except to demonstrate proper equipment operation.

**PLEASE NOTE:** For all OffSite Education listed above: CEU credits may be available for each participant that meets the Guidelines provided by Philips. Travel and lodging are not included, but may be purchased through Philips. It is highly recommended that 989801292093 (MR Full Travel Pkg OffSite) is purchased with all OffSite courses. Due to program updates, the number of class hours is subject to change without notice. Customer will be notified of current, total class hours at the time of registration. OffSite training is scheduled based on your equipment configuration and availability.

Education expires one (1) year from equipment installation date (or purchase date if sold separately). Ref# 62616026614615622762286229-20150615

2	<b>MRI Conversion to Philips</b>	1
	Clinical Education Program for MR Conversion to Philips Systems:	

**Conversion FollowUp Onsite Education:**

Philips Education Specialists will provide twenty four (24) hours of additional Follow-Up Education for up to four (4) students, selected by customer, including technologists from night/weekend shifts if necessary. CEU credits may be available for each participant that meets the guidelines provided by Philips. Note: Philips personnel are not responsible for actual patient contact or operation of equipment during education sessions except to demonstrate proper equipment operation.

Education expires three (3) years from equipment installation date (or purchase date if sold separately). Ref #609601727-20141215



Line #	Description	Qty
3	<b>T/R Interface 1.5T</b> T/R Interface with connector on gantry to enable connection of Transmit/Receive coils.	1
4	<b>dS Flex L 1.5T</b> An integrated coil solution for general-purpose imaging. It includes two large flexible general-purpose coils. Combined with the FlexCoverage Posterior coil they enable 20 cm coverage, with a maximum of 8 channels. The shape and size of the flexible coil elements enable a wide variety of applications, including imaging of large anatomies. The coil can be used to locally enhance resolution of images acquired over a larger FOV, for example in pediatric applications. <ul style="list-style-type: none"> <li>• Coverage: 20 cm</li> <li>• Maximum nr. of channels: 8</li> <li>• Main application: Shoulder, Hip, Head, Brachial plexus, Pelvis, Cardiac, Pediatric</li> <li>• Coil type: Integrated</li> <li>• dS-SENSE enhanced parallel imaging performance</li> </ul>	1
5	<b>dS FootAnkle 16ch 1.5T</b> Ski-boot shaped coil for optimum coverage of the ankle and entire foot up to the toes also in large foot sizes. The coil design and element layout allow for either large FOV imaging of the whole foot or small FOV high resolution imaging for ankle joints. The coil is easy to set up and can be used with the patient's foot vertical or up to 20 degrees plantar flexed. In Vertical position the coil can be tilted using a tilting device for maximum patient comfort. <ul style="list-style-type: none"> <li>• Coverage: 32 cm in A/P direction and 24 cm in H/F direction</li> <li>• Maximum nr. of channels: 16</li> <li>• Main applications: Foot, Ankle, Toes</li> <li>• Coil type: Dedicated</li> <li>• dS-SENSE enhanced parallel imaging performance</li> </ul>	1
6	<b>dS SmallExtr 16ch 1.5T</b> Semi-flexible coil designed for imaging of elbows, hands, small knees and shoulders. The coil has an inner diameter of 20 cm to match the size of the small extremities. It has a flexible wrap-around design for easy positioning and good fit. A mattress that supports both patient and coil is provided to increase patient comfort and avoid motion. <ul style="list-style-type: none"> <li>• Coverage: 24 cm in H/F direction</li> <li>• Maximum nr. of channels: 16</li> <li>• Main applications: Extremities, Elbow, Arm, Shoulder</li> <li>• Coil type: Dedicated</li> <li>• dS-SENSE enhanced parallel imaging performance</li> </ul>	1
7	<b>dS Shoulder 16ch 1.5T</b>	1

Line #	Description	Qty
	<p>Coil designed for high image quality throughout the shoulder joint, with excellent penetration into the labrum. The coil consists of a base anterior part and an adjustable anterior part which can be raised and tilted for comfortable positioning. The coil can be positioned on the left or the right side of the table to scan the right or the left shoulder.</p> <ul style="list-style-type: none"> <li>• Coverage: 18 cm LR</li> <li>• Maximum nr. of channels: 16</li> <li>• Main application: Shoulder</li> <li>• Coil type: Dedicated</li> <li>• dS-SENSE enhanced parallel imaging performance</li> </ul>	
8	<p><b>Multi Camera Color</b></p> <p>The Multi Camera Color solution provides two color cameras and a Camera interface box which allows for up to 4 cameras to be connected: 3 MR compatible cameras and 1 outside exam room camera. The patient observation cameras are color cameras including a varifocal zoom lens that can be mounted at any convenient position within the examination room to visually monitor the patient, or outside the examination room, e.g. as a surveillance camera for the prep room or the waiting area. The images are displayed on the Patient Observation Monitor (ordered separately) in the scanner control area.</p> <p>Features:</p> <ul style="list-style-type: none"> <li>• 2 MR compatible cameras</li> <li>• Camera interface box</li> <li>• Easy mounting to walls</li> </ul>	1
9	<p><b>dS Knee 16ch 1.5T</b></p> <p>Coil designed for ultra-high SNR imaging over an extended field of view of the knee and other extremities. Two overlapping rings of eight elements extend the coverage area and minimize the need for precise positioning. dS-SENSE enhanced parallel imaging can be selected in all directions. The dS Knee 16 ch has a split design for easy patient setup and an ergonomically ramped insert for patient comfort.</p> <ul style="list-style-type: none"> <li>• Coverage: 20 cm</li> <li>• Maximum nr. of channels: 16</li> <li>• Main applications: Knee, extremities</li> <li>• Coil type: Dedicated</li> <li>• dS-SENSE enhanced parallel imaging performance</li> </ul>	1
10	<p><b>dS T/R Head 1.5T</b></p> <p>Transmit/receive coil, consisting of a base, sliding coil and head support, that provides excellent spectroscopy results due to its higher B1 field. In addition, it enables imaging of patients with stereotactic frames. The open design reduces claustrophobia, while ensuring good homogeneity.</p> <ul style="list-style-type: none"> <li>• Single channel transmit</li> <li>• Single channel receive</li> <li>• Main applications: Head, Brain, Spectroscopy, Extremities, Patients with stereotactic frames.</li> </ul>	1
11	<p><b>dS NeuroSuite Pro</b></p>	1

Line #	Description	Qty
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#### dS **NeuroSuite Pro**

In addition to the dS **NeuroSuite Plus**, the dS **NeuroSuite Pro** includes novel techniques, like 3D NerveVIEW that improves visualization of the brachial and lumbar plexus. Black Blood imaging that helps you better differentiate the vessel lumen from the intra lumen blood signal, may empower you to resolve complex issues with more confidence.

At Philips, we understand your challenging business environment and your need to increase profitability and grow revenue. This set of advanced diagnostic applications can help you differentiate yourself from competitors and increase your referral services.

The dS **NeuroSuite Pro** includes:

- Black Blood imaging
- 3D NerveVIEW
- Zoom Diffusion imaging

#### **Black Blood imaging - Enhance your diagnostic confidence for Brain imaging**

Black Blood imaging helps you better differentiate the vessel lumen from the intra lumen blood signal. This enhances your diagnostic confidence by performing your 3D brain imaging with higher and isotropic imaging resolution\* with a reduction of the intra-lumen brain blood signal\*\* over the complete imaging volume.

*\* Compared to our 2D double inversion methods with same brain coverage and scan time*

*\*\* Compared to our 3D T1w scan without MSDE pre-pulse*

#### **3D NerveVIEW - Review nerve plexus, non-invasively**

3D NerveVIEW improves visualization of the brachial and lumbar plexus by providing you with a high resolution T2w TSE acquisition with reduced remaining intra-lumen signal of the veins\*. In addition, the 3D isotropic imaging method allows for reformats in any plane (including oblique) without loss of resolution helping you to save scan time and improve spinal nerve plexus assessment.

*\*By use of MSDE black blood pre-pulse with STIR/SPAIR, compared to our STIR/SPAIR sequence without MSDE pre-pulse*

#### **Zoom Diffusion imaging - Small FOV diffusion imaging for improved image quality**

Zoom Diffusion allows you to acquire small FOV imaging, down to 200 x 50 mm, with reduced geometrical distortion, due to reduced EPI echo train length in DWI-EPI compared to conventional full FOV DWI-EPI, and higher spatial resolution, due to smaller acquisition voxel size compared to full FOV DWI-EPI, with same level of geometrical distortion.

12	<b>dS BodySuite</b>	1
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#### dS **BodySuite**

Based on our dStream digital broadband architecture, dS **BodySuite** helps you overcome some of the challenges associated with imaging the liver, pelvic area and breast. Short breathholds, high-resolution data in multiple directions and short scan times help you gain a clear view of your patient. Innovative solutions like non-invasive liver fat fraction quantification let you extend the benefits of MR to a broader patient base while gaining the insight you need. This provides diagnostic decision support and allows you to deliver a comfortable patient experience. These tools not only help you address clinical needs, they also help you find answers to business challenges. Having access to advanced diagnostics may help you differentiate your services and expand your referrals .

The dS **BodySuite** includes:

Line #	Description	Qty
	<ul style="list-style-type: none"> <li>• 3D PelvisVIEW</li> <li>• 3D BreastVIEW</li> <li>• 4D-THRIVE/BLISS</li> <li>• mDIXON Body Fat Quant Specialist</li> </ul>	
	<b>3D PelvisVIEW - View your 3D TSE imaging data in any plane</b> 3D PelvisVIEW is an advanced 3D TSE technique that lets you acquire high-resolution data in multiple directions, including oblique, in one scan helping you enhance your confidence when diagnosing lesions.	
	<b>3D BreastVIEW - View your 3D TSE imaging data in any plane</b> 3D BreastVIEW is an advanced 3D TSE technique that lets you acquire high-resolution data in multiple directions, including oblique, in one scan helping you enhance your confidence when diagnosing lesions.	
	<b>4D-THRIVE/BLISS</b> 4D-THRIVE/BLISS is a time-resolved 3D technique to drastically accelerate dynamic body and breast imaging through the combination of a keyhole method with CENTRA and SENSE.	
	<b>mDIXON Body Fat Quant Specialist - Non-invasive liver fat fraction quantification</b> mDIXON Quant brings a fast and simple 3D procedure for noninvasive liver fat quantification by providing high quality 3D fat fraction maps of the whole liver, even for short T2*, with high accuracy ( $\pm 3.5\%$ ) and reproducibility ( $\pm 1.4\%$ )** allowing you to expand your MRI capabilities. T2*/R2* relaxation maps are provided to further help your diagnostic assessment. <i>**Accuracy and reproducibility were assessed using a reference liver protocol, on fat phantoms [range: 0-100%]. Reproducibility assessed over systems.</i>	
13	<b>In-bore Connect enabled</b>	1
	With this option your MRI system is able to link to the AE In-bore Connect solution.	
14	<b>HA FlexTrak</b>	1
	Dockable patient transport system for simplified patient preparation, handling and transportation from preparation room to the MR scanner, without repositioning the patient. <ul style="list-style-type: none"> <li>• HA: Height-adjustable to facilitate easy patient transfer</li> <li>• Lightweight, easy to maneuver FlexTrak dockable patient transport system docks and undocks quickly and easily with patient support and table top. Docking is possible from both sides.</li> <li>• Patient and coils can be prepared outside the MR room. No need to remove coils or to reposition patients.</li> <li>• Integrated coil connections on table and FlexConnect connectors for efficient patient management and rapid evacuation.</li> <li>• Easy to use foot pedal locks wheel direction during transport or brakes the FlexTrak while standing still.</li> <li>• When the FlexTrak is positioned and locked against a wall, an adjustable side-rail can be used to prevent a patient from falling.</li> <li>• Optional second FlexTrak offers economical solution to allow improved throughput.</li> <li>• 250 kg / 550 lb capacity</li> </ul>	
15	<b>FlexCaddy</b>	1

Line #	Description	Qty
	Coil storage cart which stores dStream coils and accessories to enhance workflow for a large range of clinical applications. Includes:	
	<ul style="list-style-type: none"> <li>• IV pole</li> <li>• Storage for <ul style="list-style-type: none"> <li>• 2x Anterior coils</li> <li>• 1x Head Top / other coil</li> <li>• 1x HeadNeck Top / other coil</li> <li>• 1x Base coil</li> <li>• Accessories</li> </ul> </li> </ul>	
16	<b>RF Coils Cabinet</b>	<b>2</b>
	Cabinet for storing RF coils and accessories. Compatible with all Ingenia, Multiva, Achieva, Intera and HFO systems.	
17	<b>Patient observation monitor</b>	<b>1</b>
	Images from the Patient Observation Cameras can be displayed on a Patient Observation Monitor positioned at a convenient location in the scanner control area. The monitor provides full visibility of the patient in all situations that require continuous visual monitoring, e.g. pediatric examinations and cardiac stress tests, as well as monitoring of patient setup and waiting areas. Features:	
	<ul style="list-style-type: none"> <li>• High brightness color LCD monitor</li> <li>• Tilt, swivel and height-adjust for an ideal viewing position</li> </ul>	
18	<b>FlexTilt</b>	<b>1</b>
	The FlexTilt is an easy to use device which allows the dS Base in combination with the dS Head and dS HeadNeck coils to be tilted. The coils can be tilted up to 18 degrees in incremental steps of 2 degrees.	
19	<b>Anterior Coil Frame</b>	<b>1</b>
	The Anterior coil frame creates a distance between the coil and the patient thereby avoiding direct contact (e.g. for peripheral vascular disease, pediatric patients).	
20	<b>MR Stereo.</b>	<b>1</b>
	The Yamaha R-S202 stereo comes with <b>Speakers</b> :	
	<ul style="list-style-type: none"> <li>• 2 channels of 100 Watt high -power output</li> <li>• Advanced circuitry design</li> <li>• Bluetooth to your favorite streaming music services</li> <li>• 40 station FM/AM preset tuning</li> <li>• Brushed aluminum finish and simplistic design</li> <li>• Speaker selector for two systems</li> <li>• Simple remote control layout</li> </ul>	
21	<b>MEDRAD MRXperion MR Injection System</b>	<b>1</b>
	The MEDRAD MRXperion Injection System is a syringe-based fluid delivery system indicated for delivery of contrast media and saline during MR procedures. It is intended to be used for the specific purpose of injecting intravenous MR contrast media and saline into the human vascular system for diagnostic studies in magnetic resonance imaging (MRI) applications with MRI scanners that have a magnetic field strength between 0.7 Tesla and 3.0 Tesla. Only trained healthcare professionals are intended to operate this device. The system consists of basic components that communicate by a direct fiber optic connection.	

Line #	Description	Qty
	<p>The Control Room Unit (CRU) contains the user interfaces (computer touch screen display with Pod) that contain controls used to program and control the injection system. Both also have individual power supplies that require AC power. These components are MR unsafe and should not be taken into the scanner room.</p> <p>The Scan Room Unit (SRU), is positioned near the magnet bore. The Scan Room Unit is MR Conditional device and should be located, installed, and operated per the specifications. It contains the integrated injector pedestal base, IV pole and head with display and controls. The SRU Power Supply is provided to power the Scan Room Unit. The SRU Power supply is MR Conditional device and should be located, installed, and operated per the specifications. The power supply can be mounted outside the scan room with the optional penetration panel filter kit or installed in the scan room at the maximum distance away from the bore or exterior scanner surface. It must be installed no closer than a minimal distance from the scanner as called out in the room layout diagram. It requires AC power and should be positioned to allow AC connection without using any AC power strips.</p>	
22	<b>MR Additional Training 24 Hours OnSite</b>	<b>2</b>
	<p>Clinical Education Specialist will provide twenty-four (24) hours of MR OnSite Education for up to four (4) students, selected by customer, including technologists from night/weekend shifts if necessary. CEU credits may be available for each participant that meets the guidelines provided by Philips. Please refer to guidelines for more information. Note: Philips personnel are not responsible for actual patient contact or operation of equipment during education sessions except to demonstrate proper equipment operation. Education expires one (1) year from the earlier of equipment delivery date or purchase date.</p>	
23	<b>MR Chiller</b>	<b>1</b>
	<p>Chiller and associated hardware designed in accordance with cooling requirements necessary for selected MR scanner with appropriate ambient and seismic options. Bundle includes chiller, remote display, interface panel and start-up kit. Installation cost is not included.</p>	
24	<b>Enhanced Warranty Terms</b>	<b>1</b>
	<p><u>Enhanced Warranty</u></p> <p>The Philips Ingenia MR System will receive the following service coverage for a period of twelve (12) months after completion of installation or availability for patient use, whichever occurs first.</p> <ul style="list-style-type: none"> <li>• Extended service coverage hours from Monday to Friday, 8am to 9pm</li> <li>• Flexible Planned Maintenance scheduling from Monday to Friday, 7am to 12am and Saturday 8am to 5pm</li> <li>• Onsite labor response of 2 hours</li> <li>• Expedited parts delivery on same day</li> </ul>	
25	<b>Universal Power Supply</b>	<b>1</b>
	<p>150KVA 3 Phase UPS 480VAC IN/OUT, Hard Wired, consists of: 1 UPS Cabinet 1 Battery Cabinet 1 Maintenance Bypass Cabinet</p>	
26	<b>Rigging Charges</b>	<b>1</b>
	<p>Special Rigging Price to be confirmed</p>	