primax
INTERNATIONAL

RAYBOW XE

DIGITAL MOBILE SYSTEM

RAYBOW XE Mobile System is the unique Digital Radiographic Mobile System to transform the Delivery Care.

Maximum Efficiency and energy autonomy thanks to its exclusive **patented Easy Moving System with Energy Recovery Technology** where the unit take advantage of the braking energy to recharge its batteries.

Its **Telescopic Column** provides complete visibility during driving and easy access to any exposition area, along with its **Effortless maneuverability** and **secure positioning** the operator has a faster and optimized workflow.

The most innovative technology application for the H**igh Frequency X-ray Generator** permits a high constant output power from any standard power socket or without it (**Stand Alone**).

Thanks to the **battery-charger with recovery Technology**, the generator can be operated much longer in any Clinic/Hospital area, Operating Rooms, Intensive Care, Emergency, etc. Images can be obtained with the patient in the sitting, standing or lying position.

The selected WIFI portable detector & software allows us the operability and profitability **demanded by new clinics and hospitals.**

MAIN TECHNICAL FEATURES

Access to any type of patient thanks to its **Telescopic Arm** and **Telescopic Column.**

Maximum Power in compact dimensions.

Accurate Diagnostic for Bedridden patients. Control Console with **19" color Touch Screen**.

LED Status Indicator

One-Hand Maneuverability. **Capacitive Touch Technology** on the Dead-man Handlebar

Fine Positioning to handle the Unit easily at the patient´s bedside. Quick collimator access.

Compact and narrow Design (only 54cm wide).

Energy Recovery Technology
Motor-Assisted and Lightweight driving:
Compact and Ergonomic Design

Anti-collision Proximity Sensors (optional).

GENERATOR 32KW

- Advanced technology for our Generator in a compact and modular design:
- **Constant Potential High-Voltage Generator** with all advantages, including lower patient dose, shorter exposure times as well as greater accuracy and consistency.
- Monoblock **without high voltage cables**.
- Minimum rise time for higher patient protection.
- The Unit is controlled by multiple microprocessors which offer a higher exposure consistency, efficiency in operation and an extended Tube life.

- Independent operation without connection to the mains, except to recharge the batteries.
- Equipped with closed loop control of X-ray Tube current, kVp and filaments, which minimize potential errors and the need for readjustments.

INPUT LINE OPERATION	100/240Vac automatic compensation ±10VAC
MAXIMUM POWER kW	32 kW, According to IEC definition IEC (0.1s, 100Kv)
MINIMUM POWER	0.4 kW (40kVp 10mA)
kVp RANGE	From 40kVp to 150kVp. In steps of 1kVp
mA RANGE	From 0.1mAs to 500mAs in 38 steps, Renard10 Scale.
mA RANGE	From 10 mA to 500 mA in 18 steps, Renard10 Scale. 10,12.5,16,20,25,32,40,50,63,80,100,125,160,200,250,320,400,500
EXPOSURE TIME RANGE	From 1,0 ms to 10.000 ms (0,001 to 10 seconds) Maximum Exposure Time Range for DR: From 1 millisecond to 2.5 seconds.
POWER OUTPUT (@ 0.1s)	150 kVp @ 200 mA 100 kVp @ 320 mA 80 kVp @ 400 mA 64 kVp @ 500 mA
RIPPLE FACTOR	<4 %
DUTY CYCLE	18 exposures per hour at maximum mAs (lapse time between exposures: 3min.)

ENERGY RECOVERY TECHNOLOGY

Focus on what is important: the patient. The unit takes advantage of its own braking energy to recharge the batteries.

Achieve 800 exposures of autonomy of unplugged autonomy and operate without limit, attending to your bedside patients, sending faster high-quality images to PACs and reaching an accurate diagnosis at first glance.

BATTERY CAPACITY

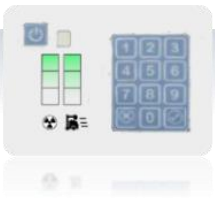
- **OBM System patented (Optimized Battery management)**: for extended battery life
- **Charge Capacity** per battery: 15 Ah.
- **Total energy storage** capacity: 5760Wh.
- **X-Ray Exposition Autonomy**: More than **800 expositions** (80 kV - 400 mA - 5ms).
- **Autonomy**:
  - More than 11 hours in stand-by (system ready to work).
  - More than 25 km @ 5.5 km/h.
  - Up to 1 km moving the unit once the exposure capacity is exhausted.
- **Charging Time**:
  - In 4 hours, 80% of the charge is available.
  - In 8 hours, 100% total charge is available.
  - 20% is charged every hour during the first 4 hours.
- **Charging Immediacy**: Allows exposures as soon as it is plugged into the mains.

X-RAY TUBE XR3331

Maximum Tension	150 KV
Type	• Rotating anode
Focus sizes	- Small Focus 0.6 mm. • Large Focus 1.2 mm.
Maximum Power	- Small focus 22 kW (60 Hz), 32 kW (180 Hz), • Large focus 54 kW (60 Hz), 78 kW (180 Hz).
Maximum Current	- Small focus 1,000 mA. Large focus 400 mA
Anode degree target angle	12°
Anode heat capacity	300 KHU
Anode Heat Dissipation Capacity	73.56 KHU/min
Housing Heat capacity	1,250 KHU
Housing Heat Dissipation Capacity	15 KHU
Anode rotation	2,700rpm (50Hz), 3,200rpm (60Hz), 9,700rpm (180Hz)

ON/OFF SYSTEM ROUTINE BY NUMERIC KEYPAD

High Security Standard to protect the use of the unit and prevent unauthorized access.



Numeric keypad for secure on/off system routine, with Four-digit access code.

MOVEMENTS

- Transform the way you work: new Motor-Drive control movement smoother, safer and very easy to use. Only one hand to move the whole unit.
- Speed up to 5.5 km/h.
- Dead-man handle with capacitive touch technology.
- Ramps up to 8°.

- When the system is out of parking position or being moved backwards, the speed is limited.

Maximum Speed (Parking Position)	Forwards: approx. 5.5 km/h Backwards: 2.5 km/h
Column Rotation	±317°
Max step	5 cm (1.9")
Max gradient	8 °

PARKING POSITION

Stress-Free driving. Parking position allows you to reduce collapsible column maintaining a clear view ahead when driving the system. When not in use, is a perfect position to store or park it in a totally compact way.

Smoothly and effortlessly, we reach the parking position by sliding the Head-assembly down until it locks into the clutch. Vice versa for the head-assembly releasement.

Dimensions and weight (H x W x D)	129x122x54cm
Height	• Max: 223cm • Min: 129cm
Weight	520 Kg

FINE POSITIONING

- It is possible to move each wheel independently, at low speed, for fine positioning.
- The four buttons on the handgrips control the motion of each driving wheel (forwards / backwards). This permits fine positioning respecting the patient, with the operator positioned opposite the Tube-Collimator Assembly.
- When the mobile is plugged to mains, only fine positioning movements are allowed.

Max. Distance from Focal Spot of X-Ray tube to Floor (SID)	202 cm
Min. Distance from Focal Spot of X-Ray tube to Floor	53 cm
Vertical Travel (X ray beam parallel to the floor)	149 cm
Telescopic-Arm Max Distance:	122 cm
Telescopic-Arm Min. Distance	70.5 cm
Collimator Rotation:	±90°
Head Rotation around arm axis	±180°
Head rotation around axis perpendicular to arm	- 30° /+90°
Head Assembly Movement Brakes	Electromagnetic Brakes (Optional)

LED STRIP STATUS INDICATOR

Status Visibility at any time. Led strip with changing color indicators to help the operator know the state of the equipment easily.

◦ **WHITE**	• The System is in standby. • Blinking when the System is moving, or an obstacle has been detected 2.5m ahead.
◦ **BLUE**	Detector ready and technique correctly set.
◦ **GREEN**	Ready for exposure.
◦ **YELLOW**	Exposure on.
◦ **ORANGE**	System error, user intervention required.
◦ **MAGENTA**	Bumper activated.

- Head Rotation around arm axis: ±180°
- Detents: -90° 0°,+90°.

- Head rotation around axis perpendicular to arm: -30° - +90°).
- Detents: 0°.

- Collimator Rotation: ±90°.
- Detent 0°.

- Electromagnetic brakes for omni-directional movement (optional).

- Telescopic Column:
  - Max SID:202 cm
  - Min Focus-Floor distance: 53 cm

- Telescopic Arm:
  - Max: 122 cm
  - Min:62.5 cm

- Column Rotation: ±317°

DRIVING & MANEUVERABILITY

New Motor-Assisted Design lighter and more compact. Smart, ergonomic, simple, super smooth and silent driving. Provides less disruption and less stress even in the quietest environments (Clinic/Hospital).

Thanks to its easy maneuverability and flexibility in positioning, we can reach any type of patient (bed, wheelchair, narrow aisles), improving productivity and helping staff to work with complete safety and ease. It offers an extraordinary image consistency for a completely accurate diagnostic.

CONTROL PANEL & SWITCHES

Control Panel, with:

- System ON/OFF Indicator.
- Battery Charge Level Indicator.
- Emergency Switch OFF.

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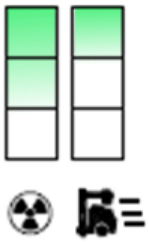


- The Exposure symbol Column indicates the charge level of the Batteries used for radiographic operations (X-ray exposures).
- Mobile X-Ray Column indicates the charge level of the Batteries used for the Mobile motion (motors).
- When unplugged from mains, the Batteries discharge independently on their use (X-ray exposures or motors).
- When plugged into the mains the Batteries will automatically charge.
- The Batteries require approximately 9 hours for a fully charge.
- It is possible to move manually the unit when battery is completely discharged (Service needed).

X-Ray hand-switch to control X ray exposures:

- PREP.
- EXP: to complete the X-Ray exposure.
- With Collimator Lamp Button to help patient positioning
- Coiled cable length from 80 to 500 cm

Connectivity:

- Hospital network:
- Wi-Fi connectivity: 802.11ac.
- Wired connectivity: Ethernet connector (RJ45: 10/100/1000 Base-Tx Fast Ethernet compatible).
- 2 x USBs accessible for the operator.
- *IR sensor for detector registration (optional)
- 5 m retractable mains cable.

Absolutely safe driving. Anti-collision proximity sensors and collision full stop:

- The mobile system slows down speed automatically when an object/person is close to it.
- Visual & acoustic indications when an object comes close to it.
- Automatic full stop of the unit when an imminent risk of collision has been detected.

MONITOR AND WORKSTATION

Get access at relevant data where and when you need it.
Thanks to the integrated workstation you can easily take the hospital applications (RIS) to the patient´s bedside. Possibility of managing the operations more efficiently, spending more time with your patient without moving to a separate Workstation.

ADVANCED TOUCH SCREEN MONITOR SPECIFICATIONS

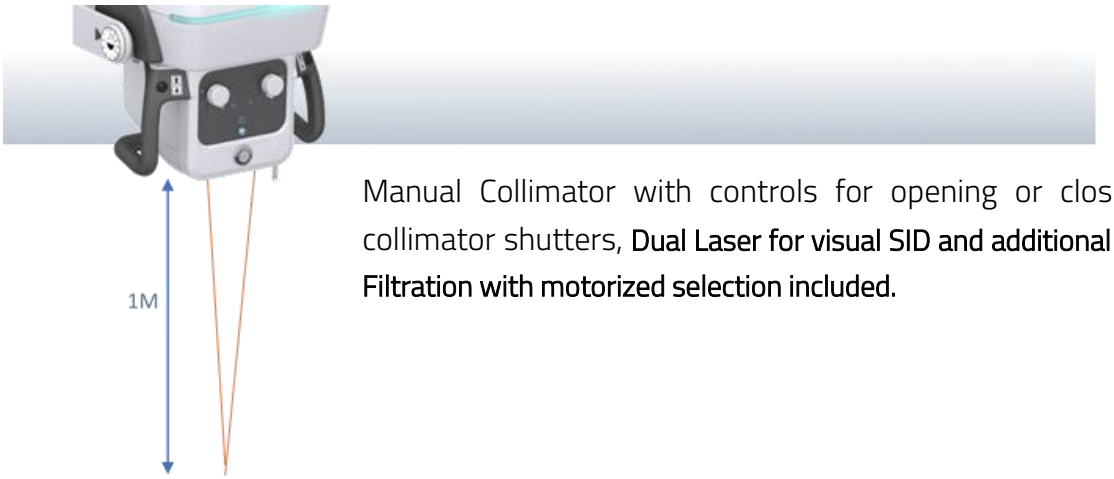
Size and Format (H-V)	**19"** Aspect Ratio 5:4	*Grayscale levels*	1,024
Touch screen	Working even wearing surgical gloves	*Viewing angle (H-V)*	178°
Native Resolution	1,280 x 1,024 pixels	*Maximum luminance (panel typical)*	330 cd/m^2
Pixel Pitch	0.294mm	*Contrast ratio (panel typical)*	1,000:1
Surface treatment	Anti-reflective (matte)	*Response time (Tr + Tf) (typical)*	30 ms
Ambient light presets	Yes	*Closed-loop brightness control*	Yes
Bit Depth:	10 bits	*DICOM Calibrated luminance*	250 cd/m2

PC TECHNICAL SPECIFICATIONS

Operative System: Windows 10
CPU: Intel® Core™ i5-7500T Processor
System Chipset: Intel® Q170 Chipset
System Memory RAM: 16GB (2x8GB) DDR4 2133MHz SDRAM SODIMM (Dual Channel
Graphics: Integrated Intel® HD Graphics 630
TPM: Infineon SL9665 TPM2.0
HD Hard Disc: SSD, 512GB Sandisk X600

Boot time: average 3 minutes
Possibility of storage for more than **20,000 images**. The system allows the configuration of auto-deletion rules for the oldest images by date or by size on the hard disk.
More than 500 pre-set programs, and unlimited capacity for additional new programs.

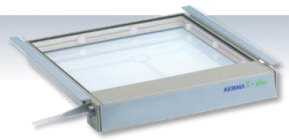
MANUAL COLLIMATOR

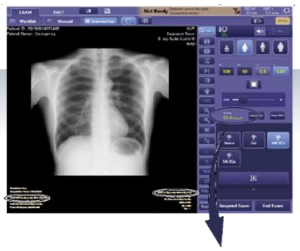


Manual Collimator with controls for opening or closing the collimator shutters, **Dual Laser for visual SID and additional variable Filtration with motorized selection included.**

Square Field	Max FOV 43x43cm at SID 1meter	**LED Light Field**	· High Luminosity (High White LED wit electronic timer). · Over 200LUX Guaranteed at 1m
Radiation Leakage Protection	· 150kVp	**Measuring Tape Shutter N°**	· Included for SID Measurements · 6 pair of shutters
Inherent Filtration Equivalent at	· 2mm AL	**Collimator Lamp Button and laser activation**	· To turn on the collimator lamp and laser lights.
Dual Laser	The projection of a single line means that the two lines overlap and consequently the lasers are correctly focused at 1m SID.	**Additional Variable Filtration** 	· **Motorized** · 1mm AL + 0,1mm Cu · 1mm AL 0,2 mm Cu · 2 mm Al.

Integrated DAP meter





◦ Radiation quality kV	From 40 to 150 kV
◦ DAP Range	From 0.1 a 99,999,999.99 µGy·m²
◦ DAP Rate Resolution	0.01 µGy·m²/s
◦ Precision	±20%.

ADAPTING KIT FOR IRAY DETECTOR

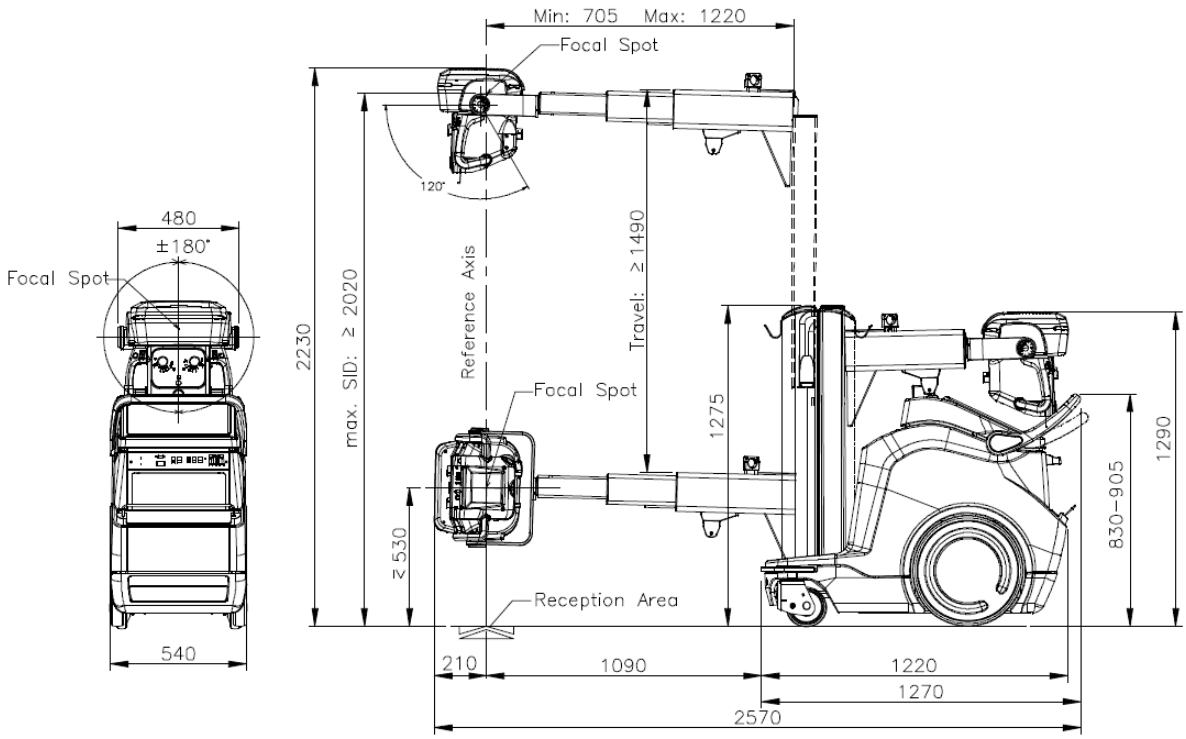
Abundant storage for detectors and their batteries arranged for a maximum ease of handling and usability: 2 detectors +2 batteries at the front and 1 detector at the rear of the unit.

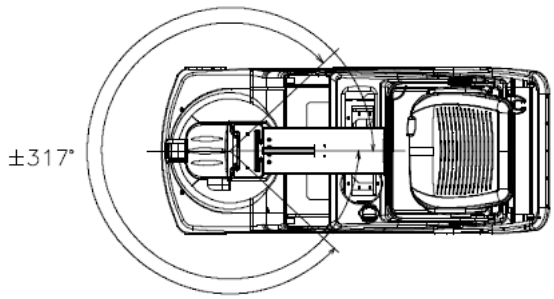
Designed with internal stops to facilitate hygienic detector bags insertion/removal and additional storage for two batteries (detector), ensuring simple and constant workflow.

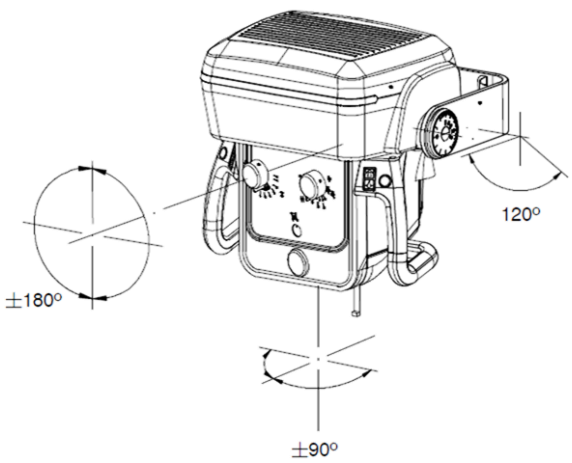
The unit incorporates a Detector safety blockage to prevent unauthorized use when the unit is alone.

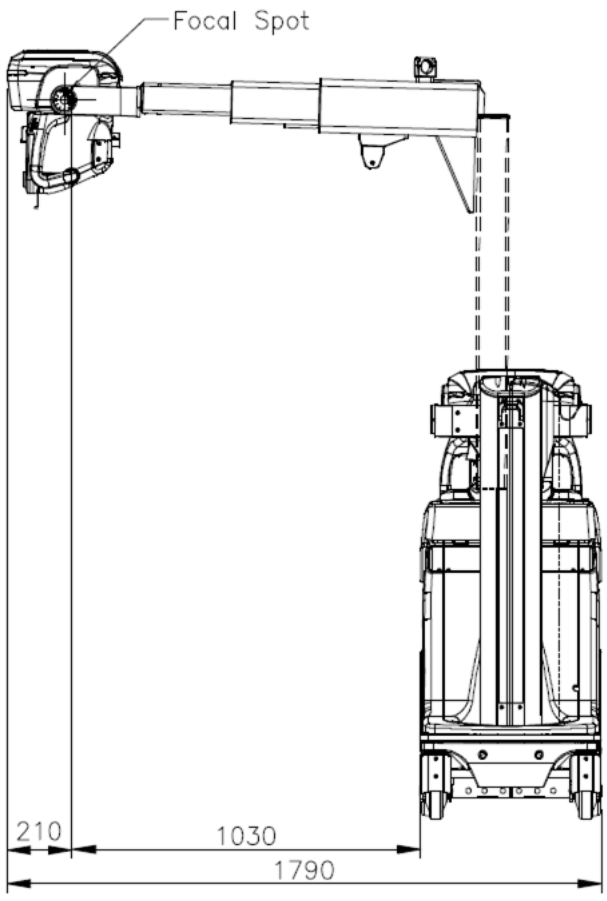
Front Storage Cabinet	• Detector Size	• Large Detector. • Pediatric Detector. • *D*etector-frame with handle *(*with/without grid).
	• Storage for detector Batteries	• 2 batteries
	• Detector **Lock Activation**	• When the unit is power off. • When the user has no permission (with Smart RFID option).
Back Storage Cabinet	• Detector Size	• Large or pediatric detectors or Detector-frame with handle (with/without grid).
	• Inner Stops for detector positioning	• For easy insertion/removal of hygiene bags

DIMENSIONS


Min: 705 Max: 1220
Focal Spot
120°
480
±180°
Focal Spot
2230
max. SID: ≥ 2020
Reference Axis
Travel: ≥1490
Focal Spot
1275
1290
830–905
≥ 530
Reception Area
540
210
1090
1220
1270
2570


±317°


120°
±180°
±90°


Focal Spot
210
1030
1790

PRIMO ACQUISITION SOFTWARE

Primo is a complete innovative and technological advanced digital DR system with multi-detector operations

- Professional acquisition software for X-ray images from flat panel systems (DR)
- The software controls X-ray generator, providing a smooth and systematic workflow.
- The professional image processing can be adapted to individual user needs and provides a complete control of all image capture
- functions within the examination room, enhancing the entire workflow by delivering diagnostic images instantly, and allowing users to move X-ray images electronically to remote workstations, image archives, and printers.
- Integrated functions and intuitive operation greatly simplify daily routine tasks.

PATIENT CREATION FRAME

Possibility of Creating manually a new study:

- Last Name and First Name
- Patient ID
- Date of birth
- Weight & Height, sex
- Accession Number
- Technician and doctor
- Patient´s notes, study description

ACCESSING THE STUDY LIST (WORKLIST)

- Possibility of Creating a new study from the Worklist.
- Possibility of requesting the Worklist from the RIS.
- Transfer one or more selected studies to the Study List.
- Associate the selected study with a previous study.
- Delete one or more selected studies.
- Delete the entire list of studies received from the RIS.
- Browse the list, if there is more than one page.
-

- On the right-hand side of the study list frame, you find the following keys:
- DICOM Store.
- Export studies to CD/DVD or USB.
- Report Tools.
- Patient´s data Edit.
- Rejected images (statistics).
- RDSR (Radiation Dose Structured Report):
- dose report of the selected study.
- DICOM SPOOLER shows the queue for DICOM store and print services.

WORKING FRAME AND IMAGE ACQUISITION

To start the radiographic exam the Working Frame led you to the exam selection window to choose the anatomical region required, then the anatomical part and finally the right exam:

- Head
- Chest
- Abdomen
- Cervical spine
- Pelvic measurement
- Humerus
- Femur
- AEC adjustment

Disposition of the Working Frame Information:

- Image area
- Exam List / Preview List
- Patient Data
- Messages Area:

This area contains indications of the detector connection status, the battery charge level, the amount of free space (%) on the archive disk and equipment status warnings and alarms.

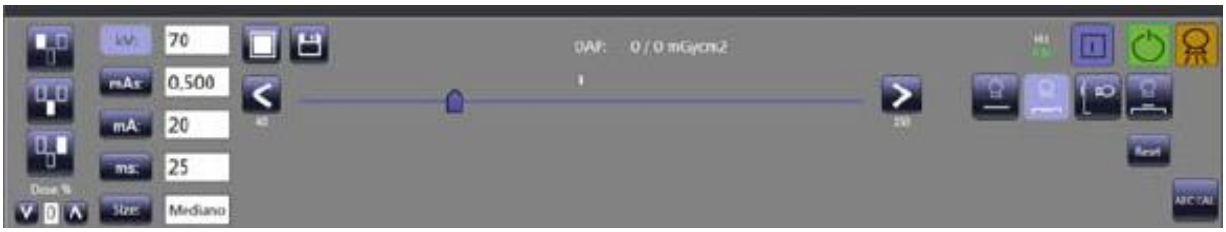
- **Generator Console** (X-ray parameters): Information about X-ray generator controls and parameters is shown in this area whenever the generator communicates directly with application. If this is not the case, information on the techniques to be selected in the generator can be displayed in this area.
- **Exam Management Area**: contains keys to delete, move or add procedure to your study, and to suspend or close the study.
- **Anatomical Region and exam selection.**

PROCEDURES TECHNIQUE

For an easy use is possible to set a Procedure to guide you through the performance of the exposures required for a study. Procedures define the exam/projection types needed for the study.

- Procedures are defined during installation of the system, in accordance with the operators and depending on the type of work required in the radiology theatre.
- A procedure can be associated to:
  - A single exam (projection) (e.g.: Std Thorax with just the PA projection of the thorax).
  - Several exams (projections) (e.g.: Full Thorax with both PA and LAT projections).
- You can either receive the Procedure from RIS via the Worklist function or chose it manually, e.g. when creating a new study manually.
- If a procedure is associated to a study, the system guides you during image acquisition and automatically presents the exams required.
- Otherwise, you need to select the exam type manually pressing the button PROC as in indicated below. All the procedures set in the system will be displayed.

X RAY GENERATION SETTING AND IMAGE ACQUISITION

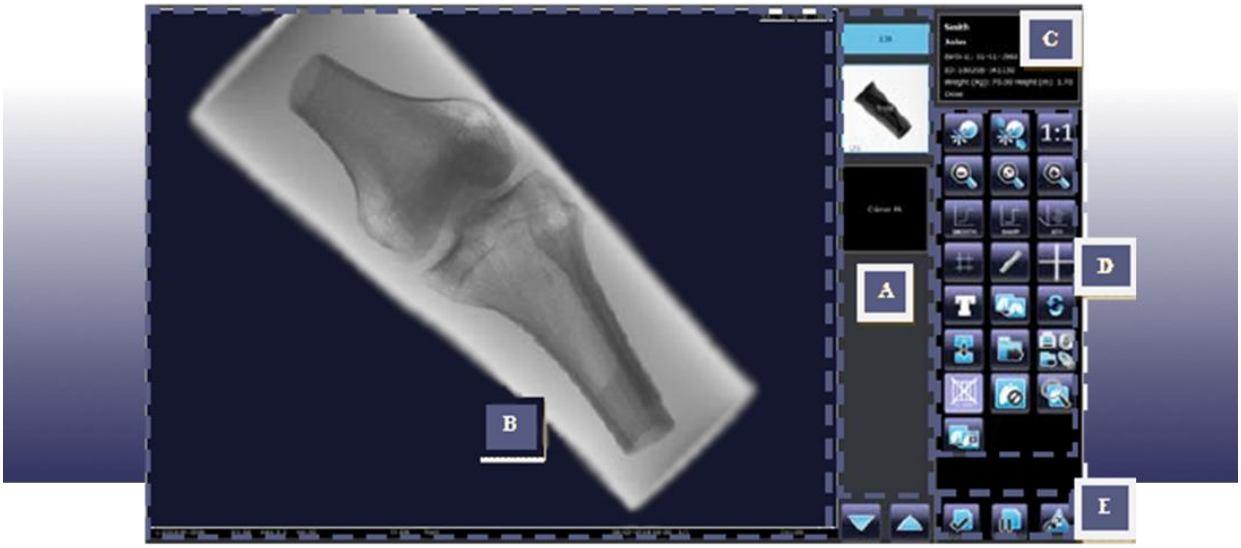


- The exposure parameters for the X-ray generator must be set to suit the exam and the patient size selected.
- To make things easier, the equipment shows the best X-ray generator settings for each exam and patient size (pre-set in the database during installation, as agreed with the users.)
- The following parameters are shown:

- 2-point technique (kV and mAs) or 3-point technique (kV, mA, and ms),
- kV, mAs, mA and ms, to suit the technique,

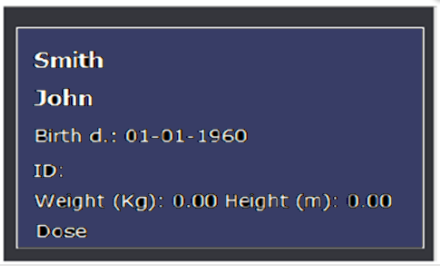
- Patient size.
- Status warning: “Ready for acquisition”

IMAGE PROCESSING FRAME



A. Previews / Exams List
B. Image area and dose information
C. Patient data
D. Image Processing commands
E. Study commands

Grey Scale	Exposure Values	Radiation Dose (DAP)	• ELT: Exposure index target according to the data of the selected technique. • EI: Exposure Index detected in the acquired image. • DI: Deviation of the Exposure index achieved from the target.	Exam / Projection	Acquisition date and time	• Image N° • Digital Zoom



- Patient´s name
- Birth Date
- Patient ID
- Weight and height
- Total Dose

IMAGE POST- PROCESSING

- Vertical/Horizontal image flip.
- Digital Zoom
- Spatial filters
- SMOOTH filter: this softens the edges of the image
- SHARP filter: this hardens the edges of the image
- SMOOTH + SHARP filters: both types of correction are applied.
- Images Cropping.
- Add object and text
- Duplicate images
- Store DICOM
- No grid functions
- Protect an image
- Image Multiview
- ATH Harmonization
- Measurements
- Distance calculation (with calibration function)
- Angle calculation.
- Rotate images
- Report Tool
- Magnifying glass
- Reject and image/Restore images
- Thumbnail.
- Brightness and contrast control.
- STATISTICS: The statistics function is used by the Technical Service when checking the system and so can only be accessed by the Advanced user.
- Allow to find the co-ordinates and pixel values for the image.
- Rectangle of a size set by the operator.
- Raw image statistics (RAW).
  - Equalized image statistics applied parameters:
  - Harmonization algorithm (ATH).
  - ROI for automatic W and L correction.
  - Gamma correction curve (LUT).
- Possibilities to export image to a removable device (CD or PEN DRIVE) in either DICOM or RAW format.
- OVERVIEW You can view more than one image in a study on the monitor at the same time. Select the overview function by pressing the relevant command.

IMAGES RECORDS

The following DICOM functions can be used to produce image records:

Export images to PENDRIVE or CD/DVD:

- The Study List frame, for exporting all the images in one or more studies,
- The Report Tool frame, for exporting specific images selected from within a study.

SEND IMAGES TO WORKSTATION/ PACS DICOM (Store DICOM):

- The Study List frame, for transferring all the images in one or more studies,
- The Report Tool frame, for transferring specific images selected from a study,
- The Working Frame, to transfer single images after post processing.

SEND IMAGES TO DICOM PRINTER:

The PRINT DICOM function is found in the Report Tool frame and lets you get a print-out of specific images selected from within a study.

SPOOLER DICOM:

This function manages the transmission of images to the DICOM network via a buffer memory (on the Hard Disk) where the images to be transmitted are stored in a queue.

DETECTOR IRAY MARS 1417X

Designed to provide the highest quality of X-Ray images with an active matrix of 2,304×2,800 pixels and **100µm pitch** (CSI).
With a Gigabit Ethernet connection for high data transfer rates and equipped with the possibility of query/upload images from detector to workstation, enable easy interchangeability between different X-Ray modalities (X-Ray mobile and fix ones).
It is the optimal choice for both retrofit and new DR System solutions, offering an effective and fast workflow.

- Wireless cassette detector. ISO 4090 fits in any bucky.
- Software with Auto-Exposure Detection.
- Best-in-class 100 µm pixel pitch with 16-bit ADC for more image details.
- Large capacity battery design, with **8+ hours battery life.**
- Lightweight design with IP56 ingress water protection.
- Supports a fast workflow for a better user experience.
- **With 200 images internal storage**
- Direct deposition CsI, with excellent DQE at all frequencies .

Very High trigger Sensitivity even with the thickest patients. Equipped with **internal X-ray sensors** which automatically detect the X-ray and synchronize image acquisition.

drop monitoring

Equipped with a unique drop monitoring system which serves as a real time tracker of panel dropping and shocking.

backup power cable, online charging solution

With its Charging connector is easy to keep the panel continuously charging without needing to replace the battery. The additional ethernet interface makes extremely easy to switch between wireless and wired mode.

long lasting battery

Faster operation, at least 500 exposures and **8,5 hours of continuous operation** before to recharge the battery. A few seconds to replace and restart the detector.

dual battery charger

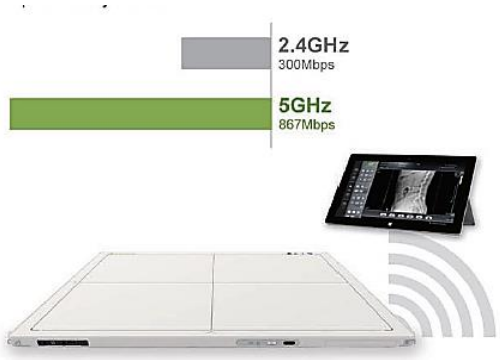
Battery charger with capacity of charging two batteries simultaneously for a non-interrupted workflow.

With Battery charging capacity indicator.

Pack of **two batteries included**.

robust wifi signals

Both 2.4G and 5G wireless mode is supported. With higher speed and stability under 5G modes.



IGZO

Faster readout speed reaching the smallest pixels for better resolution and lower noise for improved low-dose DQE and less leakage for higher dynamic range.

TECHNICAL DATA – MAIN CHARACTERISTICS	
Detector Technology	Amorphous Silicon (a-Si) TFT
Scintillator	CsI (Cesium Iodide)
Active Area	350 x430mm
Pixel Matrix	3.500 x 4300
Pixel Pitch	100 µm
Gray Scale	16bit
Spatial Resolution	4.3 lp/mm
AD Conversion	16bit
Battery Autonomy	8.5h
WiFi	2.4G and 5G
Trigger Mode	• Software (with Auto-Exposure Detection). • AED (Optional).
Full Image Time	Typ. 3.5s
Dimensions	460x384x15mm
Weight with battery	3.0 kg
Drop Monitoring	70cm @3mm PVC
Static Loading	300Kg (over the surface) 150kg (on an area 4cm diameter)
Protection Index	IP56
MTF	70% (1.0 lp/mm) 40.4% (2.0 lp/mm) 22.8% (3.0 lp/mm)
DQE	73.4% (0 lp/mm) @RQA5 55.9% (1.0 lp/mm) @RQA5 40.4% (2.0 lp/mm) @RQA5 28% (3.0 lp/mm) @RQA5
Operating Temperature	10-40 °C
Image Acquisition Time	3 sec
BATTERIES	
Rated Capacity	Min. 4,700mAh, Typ. 4,900mAh @ Discharge 0.2C
Nominal Voltage	11.55V
BATTERY CHARGER	
Simultaneous Charging	Pack of 2 batteries
Full charging time	3 hours
Rated power supply	24V(DC)
COMPONENTS	
Components included	1 Adapter for detector and battery charger 2 Batteries (Pack) 1 Gigabit Ethernet cable 1 AC Power Cable 1 DC Power Cable

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