X-FRAME DR EZ Ceiling Solution

Chest, General and Trauma X-Ray System

Product Data

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ITALRAY **X-FRAME DR EZ CEILING SOLUTION** is a digital ceiling suspended high productivity system to provide full coverage of the patient with all horizontal and vertical projection for general x-ray examination and trauma patients of both adult and pediatric, and it is composed by:

- ITALRAY **PIXEL CP** High frequency microprocessor controlled X-ray Generator
- ITALRAY **BS45 vertical bucky** (optional **TIETON multifunctional bucky**)
- ITALRAY **BTE a radiographic 4-way elevating table**
- ITALRAY **TELESCOP X-ray ceiling suspension tube stand**
- ITALRAY **X-FRAME DR Digital Acquisition Workstation**
- ITALRAY mobile table (optional)
- X-RAY Tube as per end user requirements and compatible with the X-Ray generator characteristics
- Flat panel detectors

ITALRAY **X-FRAME DR EZ CEILING SOLUTION** increases significantly department productivity featuring high device positioning automation, anatomical programs, predefined working positions and very short time for image displaying.

The ITALRAY PIXEL CP X-ray generator is capable of a tube output frequency up to 400 kHz. Thanks to this feature a very high X-ray beam quality is guaranteed at all load conditions. Once the exam is selected on the digital workstation, all the radiological acquisition parameters are immediately set on x-ray generator. This important feature moreover increasing the department productivity reduces the occasion of errors during exam procedure.

ITALRAY **X-FRAME DR EZ CEILING SOLUTION** is based on the solid-state detectors, featuring amorphous Silicon (a-Si) technology and Gadolinium (GoS) or Cesium Iodide (CsI) scintillator: a combination that guarantees high quality X-ray images for immediate diagnosis, in real time and with low exposure.

ITALRAY **X-FRAME DR EZ CEILING SOLUTION** versatility is greatly increased thanks to the wireless cassette-size detector that can be positioned either in vertical/horizontal bucky and out of them, in in contact to the patient. This detector is battery powered and employs wireless image data transmission, thus freeing the room from cumbersome and risky cables for an unlimited operation autonomy.

ITALRAY **X-FRAME DR EZ CEILING SOLUTION** can be supplied with a number of automatic/motorized movements that greatly enhances system productivity.

The everest-X algorithm automatically optimizes image-processing based on exam type and anatomical region. everest-X enhances image content details in both high attenuation image areas (shoulders, abdomen) and, at the same time, low attenuation image areas (lungs, cavities).

Additional post-processing tools are also available such as Edge Enhancement, Unlimited Zoom and Real Size, Window/Level (auto and manual), Measurements, Annotations, Electronic Collimators, Image Stitching (auto and manual), Deviation Index (DI), Exposure Index (EI). The X-FRAME DR software is integrated with an easily configurable Full DICOM package compatible with any RIS and PACS system or DICOM Printer.

ITALRAY **X-FRAME DR EZ CEILING SOLUTION** can be supplied with fixed and/or mobile Wi-Fi flat panel detectors, in order to perfectly fit all customer needs.

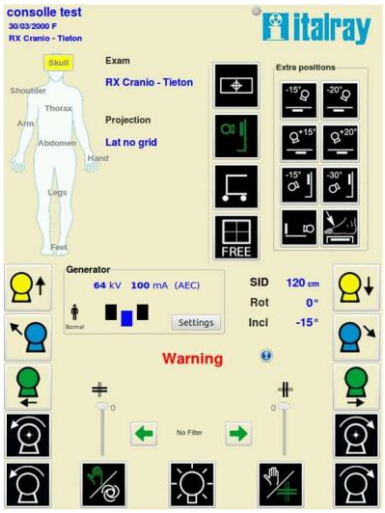
A wide number of configurations are available as shown in the table below:

X-FRAME DR EZ CEILING SYSTEM : DETECTOR CONFIGURATIONS			
	N° of detectors	**Vertical Bucky**	**Horizontal Bucky**
I)	1 Wireless detector	Wireless	
II)	2 Fixed detectors	Fixed	Fixed
III)	1 Fixed detector + 1 Wireless detector	Fixed	Wireless
IV)	2 Wireless detectors	Wireless	Wireless
V)	No detector	Ready for digital flat panel integration	

MAIN CARACHTERISTICS

COLOUR TOUCH-SCREEN USER INTERFACE FOR CEILING TUBE STAND(*)

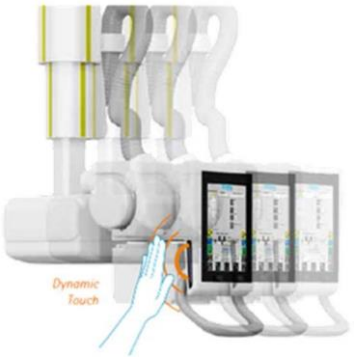
This wide (12") touch-screen control panel makes available in the x-ray rooms, multiple functions to display and edit patient data and acquisition parameters directly in the examination room



DYNAMIC TOUCH (*)

Automatic movements are activated via sensors positioned on both sides of the touch screen console.

An additional full system remote control is available from the remote console in the control room.



FULL SYNCHRO REMOTE CONSOLE (*)

All automatic and motorized movements can be easily controlled in the control room, with this ergonomic console. Automatic system position is driven without entering exam room, as soon as the worklist is downloaded.

(*) Optional

MAIN CARACHTERISTICS

AUTO-TRACKING (*)

X-ray tube and digital flat panel detectors automatically aligned for a simple and correct exam execution.

Automatic alignment also in oblique projections.

AUTOFOCUSING (*)

Selected SID automatically maintained during table elevation.

AUTO-POSITIONING (*)

X-FRAME DR EZ CEILING SOLUTION full automatic positioning is based on selected exam and projection, starting from a set of predefined and customizable system positions.

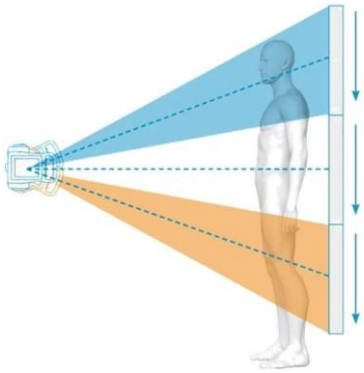
Automatic positioning is controlled both from remote console and from touch screen x-ray tube.

(*) Optional

MAIN CARACHTERISTICS

AUTOMATIC STITCHING (*)

For Full-Spine and Full-Leg images, with dedicated orthopaedic tools, X-FRAME DR EZ CEILING SOLUTION acquires images with a fully automatic and very fast procedure in which X-ray tube and digital flat panel detector move automatically and always aligned. Adjacent images are then automatically stitched together in just one single image.



The entire procedure guarantees a maximum patient comfort and optimal image quality with minimized risk of patient movement thanks to very short exposure times.

TIETON: MOTORIZED TILTING (*)

Automatic motorized detector vertical movement and automatic motorized detector tiling and rotation: all these advanced functions assure maximum system versatility for all applications.

TIETON: AUTO-GRID ALIGNEMENT (*)

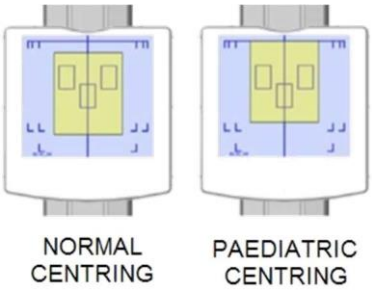
Thanks to the automatic motorized detector tilting and rotation movements, grid and ionization chambers are always perfectly aligned in order to perform emergency exams on mobile tables, also for oblique projections.

(*) Optional

MAIN CARACHTERISTICS

SPECIAL COLLIMATION FOR PAEDIATRIC PATIENTS

For paediatric patients, the collimation is aligned with the superior border of the detector and not centered on the detector center. In this way patient is not exposed to unnecessary radiation.



CONTROL AND SAFETY

COLLISION PREVENTION

Automatic movements are instantaneously blocked when the proximity sensors detect an obstacle in the direction of motion, only after removing the obstacle, the system restarts.

In addition to keep everything under control, each movement is only of intentional type (deadman).

SHARING SOLUTIONS

The wireless digital flat panel detectors can also be shared with ALL other Italray DR and DRF systems, for a maximum optimization of investment.

TECHNICAL SPECIFICATIONS	
PATIENT TABLE	BTE (ITALRAY)
Type	6 way floating radiolucent table, scratch resistant flat tabletop with longitudinal, transversal and vertical movement with electromagnetic breaking system.
Elevating table	Yes
Height	55 – 88,5 cm – Motorized
Elevating speed	2,4 cm/sec
Max load	Dynamic max load: 280 kg. Static max load: 350 kg
Controls	Foot commands for elevating table Up/ Down and for releasing the electromagnetic breaks for horizontal and transversal movements
Safety protection	Safey mechanical friction that stops the table whenever the obstruction force is major than 5kgs against the movement direction.
Material	Composite fiber carbon equivalent
Size	220 x 80 cm
Absorption	< 0,5 mm Al @ 70kVp
Movement	6-Way movement
Long. travel	± 50 cm (100 cm) Optional: (± 55 cm (110 cm) (*))
Tranvers. travel	± 13 cm
Detector travel	(Motorized (*))
Patient coverage	183 cm
Automatic and synchro movement	Auto-centring / Auto-tracking (*) (also for oblique projections)
Detector tray	Predisposed for both fixed and wireless ISO 4090 detector
ION chamber	3 field ION chamber for AEC
Accessories	Handgrips, Compression band, Lateral cassette/detector holder
Bucky type	Orientation detector sensor on board
Extractable stationary high performance grid	Ratio 12:1
Detector type	**Mars 1717V3** Portable wireless cassette sized to allow fast and efficient exposures as well as special angulations across the table
Detector Technology	Amorphous silicon/Cesium Iodide (CsI)
Active image size	43x43 cm (17''x17'') Format (ISO 4090)
Active detector matrix	3072 x 3072 pixels
Image depth	16 bit
Pixel pitch	139 µm
Typical DQE (@ 0lp and RQA5, per IEC 62220-1)	@ 0 lp/mm: 66% @ 2 lp/mm: 38%
Image transfer to printer	< 5 seconds

(*) Optional

TECHNICAL SPECIFICATIONS

VERTICAL WALL BUCKY	BS45
Min Detector Centre Height (Vert. Pos.)	44 cm
Max Detector Centre Height (Vert. Pos.)	202 cm
Vertical travel	162 cm Manual Counterbalanced (Motorized (*))
Vertical travel speed	6,6 cm/s
Max patient coverage	201 cm
Automatic and synchro movement	Auto-centring / Auto-tracking (*) (also in oblique projections)
Collision Detection	Proximity sensor
Surface – detector distance	6 cm
Radiation absorption	< 0.5 mm Al eq @ 70 kVp
Stationary high performance grid	Ratio 10:1
Detector tray	Predisposed for both fixed and wireless detector
Detector type	**Mars 1717V3** Portable wired integrated cassette configuration
Detector Technology	Amorphous silicon/Cesium Iodide (CsI)
Active image size	43x43 cm (17''x17'') Format (ISO 4090)
Active detector matrix	3072 x 3072 pixels
Image depth	16 bit
Pixel pitch	139 µm
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ION chamber	3 field ION chamber for AEC

TECHNICAL SPECIFICATIONS

CEILING TUBE SUSPENSION (TELESCOP ITALRAY)

	
Type	Counterbalanced lightweight and easy to move ceiling mounted system with motorized movements in all directions.
Longitudinal travel	3500 mm (longer/shorter length optional). Automatic and motorized movement (*)
Transversal travel	2500 mm (longer/shorter length optional). Automatic and motorized movement (*)
Vertical Travel	1500 mm (1000, 1200, and 1800 mm optional). Automatic and motorized movement (*)
Tube movements	Possible thanks to the dedicated handlebar with electronic pressure switch to unlock all the electromagnetic breaks and release the tube for every movement.
Controls	Tube is provided also with dedicated color coded deadman pressure controls to unrelease electromagnetic breaks for each single movement.
Rotation of column with respect to its vertical axis	+200°/-135° mechanical stops every 90° (Automatic and motorized movement (*)).
Rotation of Tube-Collimator Assembly with respect to its transverse axis	+180°/-180° mechanical stops every 90° (Automatic and motorized movement (*)).
Console	Handgrip with Ergonomic controls. One single button to release all movements. Centering device inlongitudinal and transverse direction
Standard console Display	LCD Display: SID, x-ray tube rotation angle and error messages.
3D self positioning moveenmt	Unit can be optionally provided with 3D self positioning movement recallable from the console in the control room and from the tube head console in the exam room.
Automatic stitching	Unit can be optiionally provided with automatic stitching movement on wall stand
Multi-functional 12.1" Color TFT-LCD touch screen display (optional)	• Patient anagraphics • Exam information • Radiological parameters • DR-room position (table height, vertical bucky tilt, tube rotation, SID, ...) • Touch-screen controls to position manually the DR room • Selected SID. • Selected collimator filters. • Tube assembly and detector centering. • Operating states such as "Manual", "Ready", "Selected", etc. • Error and warning messages

TECHNICAL SPECIFICATIONS

X-RAY TUBE (IAE RTM 101 HS)

Type	Dual focus high speed rotation X-Ray tube
Anode speed	3000 and 10.000 routes/min
Tube construction	RTM
Tube voltage range	40-150 kV
Anode Storage Capacity	400 kHU
Anode heat dissipation rate	120.000 HU/min
Target angle	13°
Focal spot size	0,6 x 0,6 mm (small focus) - 1,2 x1 ,2 mm (large focus)
Focal spot power	27/46kW@3000rpm, 40/80kW@10000rpm
Inherent filtration	0,7 mm Al @ 75 kV
Total (tube, housing) filtration	>2,2 mm Al @ 75kV

(*) Optional

TECHNICAL SPECIFICATIONS

COLLIMATOR (ITALRAY)

	
Type	Full size multi-leaf manual and automatic collimator unit with integrated LED light and centring lamp with retractable measuring tape for SID measurement, 5'' touch screen display with collimator aperture, SID measurement and tube inclination
Blade control	Manual. Automatic and Motorized (*)
Collimator rotation	±90°
Light source	LED lamp > 160 LUX
Timer	Electronic adjustable timer: 20s standard
Collimation	Square field multilayer (0x0 cm – 48x48 cm @ SID=1 m)
Laser centering	Included
Al eq contribution to total filtering	Min 1,2 mm Al
Additional filtration	• 1 mm Al + 0,1 mm Cu • 1 mm Al + 0,2 mm Cu • 2 mm Al + 0,3 mm Cu Manual selection / Remote control (motorized)(*)

TECHNICAL SPECIFICATIONS	
X-RAY GENERATOR	PIXEL CP 850 (ITALRAY)
	
Type	Three phase high frequency Inverter type microprocessor controlled X-Ray Generator with self diagnostic function and fault code signalling
Output frequency	Up to 450 kHz
Output power	80 kW
Low ripple	< 1%
kV range	40 - 150 kV. Precision: 1kV
mA range	10 to 1000 mA. (800 mA@ 100kV)
mAs Range	0,1 - 1000 mAs
Time range	1 - 6300 ms. Precision: 77 steps. (optional Up to 10s)
HSS (High speed starter) device	On board
APR	Unlimited anatomical programs divided by body part, projection and patient dimension and age
Radiological techniques	3 points (kV; mA, mS) technique, 2 points (kV, mAs) technique, 1 point (kV) technique with AEC
Independent Operation	Yes. X-ray Generator can also work independently with other imaging supports i.e. film and/or CR
Generator Console	Generator controls integrated in the Acquisition Workstation whenever the system is provided with FPD. All generator and tube status warnings and anatomical programs are available throught the acquisition workstation interface. Generator is provided with continuous self check of all generator status.
Automatic Exposure Control (AEC)	With 3-field ION chambers in each bucky (table and wall stand)
Dose Area Product (DAP)	Yes (*), with dose information stored in image DICOM header (*)
Overload protection	Yes, with indicator on console to show tube capacity
Automatic mains compensation	Yes
Focus selection	Manual and automatic when APR program is selected

(*) Optional

TECHNICAL SPECIFICATIONS

ACQUISITION AND IMAGE PROCESSING SYSTEM (ITALRAY)

	
Type	Fully automatic, digital radiographic workstation with patient and exam management system, acquisition, post processing and DICOM capabilities
	X-FRAME DR EZ
HARDWARE	
HDD	Read only hard disk for operative system. This means that all OS settings are protected. Operative system can be updated remotely. No anti-virus software is needed. Hard disk for image storage: 2 TB
CPU	Intel i5 (6 cores)
RAM	16 GB
CD/DVD recorder (*)	Yes (*). Integrated
Operating system	Windows Embedded
Mouse & Keyboard	Included
Network	Gigabit Ethernet conformant to IEEE802 LAN connectivity standards (10/100/1000 Mbits/sec) 2 available network ports. 1 dedicated to Access point for detectors, the second dedicate to Hospital network connection
Communication protocol	TCP/IP with configurable IP network addresses
Access point	802.11g/108 Mbps 2,4 GHz Wireless Access Point
UPS	Yes (*). Emergency power unit system that grants for safe and controlled switch off preventing any data loss or damage.
Video board	Hi res Invidia Video Board
Image storage capacity	52.500 high res storable images

SOFTWARE

	
Software name	X-FRAME DR
Upgradeability	Software is upgradeable remotely for any removal of software bug or further implementation.
Software control	Software is capable of controlling and monitoring the generator, the detector and tube
Dedicated console with automatic movement acknoledgement	Dedicated console is capable of automatically performing the 3D movements with **deadman** command which means that every movement needs to be operator intentional or better acknoledged by operator which keep the command pressed intentionally.
Generator integration	Generator control is directly embedded into the software. This permits the operator to easily choose a predefined APR program in dependance of the body part, projection and patient dimension and to easily adjust this last with one single click. APR programs are available also for peditric patients where low dose is mandatory.
Anatomical programs (APR)	All available anatomical programs are specifically built on the basis of the detector performance curve in order to optimize the detector performances and provide the lowest dose possible to the patient. Anatomical programs are fully customizable.
Emergency push button	Directly embedded into the Unit main console in control room
Patient and Exam Management	Included. Patient data can be entered manually, automatically though RIS Workstation or through bar code reader
Post processing capabilities	Image Flip/Mirror, R.O.I., Pan/Zoom, Window/Level, Automatic Window/Level, Annotations, Linear and angular measurements, Greyscale Inversion, Image Rotation, Electronic Collimators, Edge enhancement and Noise suppression Filter selection, Multi-Images Visualization (Mosaic), Exposure index, Multi tasking technique, Reject analysis and QC tools
Time within one exam and the following (Cycle time)	Less than 12sec
Time to have diagnostic image on screen after taking exposure	< 5sec
APR	Yes, preconfigured and editable
Exposure Index	Yes
Deviation Index	Yes

(*) Optional

TECHNICAL SPECIFICATIONS

MONITOR AND DICOM FEATURES

STANDARD MONITOR

Type	Medical grade **Eizo Radiforce MX243W**
Size	24.1''
Recommended resolution	1920 x 1200 (Full HD)
Contrast	1350:1
Brightness	410 cd/mq
View angle (Horizontal/Vertical)	178°/178°
Response time	22ms
Matrix Type	IPS

DICOM FEATURES

DICOM Storage (SCU)	Yes. Send Image to the unlimited PACS servers.
DICOM Modality worklist (SCU)	Yes. Interface with HIS / RIS with auto refresh option
DICOM Print management Class	Yes. Covers the general cases of printing medical images in standardized layouts
DICOM Media exchange (DICOM DIR)	Yes (*). Patient images export to DVD/CD
DICOM MPPS (SCU)	Yes (*). Send the status of exams to HIS / RIS
DICOM Storage commitment (SCU)	Yes (*). Send commitment status
DICOM Verification (SCU) (*)	Yes (*).
DICOM Query / Retrieve (SCU)	Yes (*). Query and retrieve images from PACS
DICOM Grayscale print (SCU)	Yes (*). Support DICOM printers
DICOM Structured Dose Report	To exchange structured data produced in the course of image acquisition or post-processing

IHE Integration Profile

Scheduled Workflow	Acquisition Modality : Patient Based Worklist Query / Assisted Acquisition protocol Setting / PPS Exception Management
Patient Information Reconciliation	Acquisition Modality
Consistent Presentation of Image	Acquisition Modality
Radiation Exp. Monitoring	Acquisition Modality

REMOTE ASSISTANCE

Remote access	ITALRAY X-FRAME DR SYSTEMS are equipped with a remote service system that allows ITALRAY service engineers to have access the system via remote network for servicing and upgrading purposes. The remote servicing system availability is subordinate upon the technical/policy characteristics of the local Hospital network.

(*) Optional

TECHNICAL SPECIFICATIONS

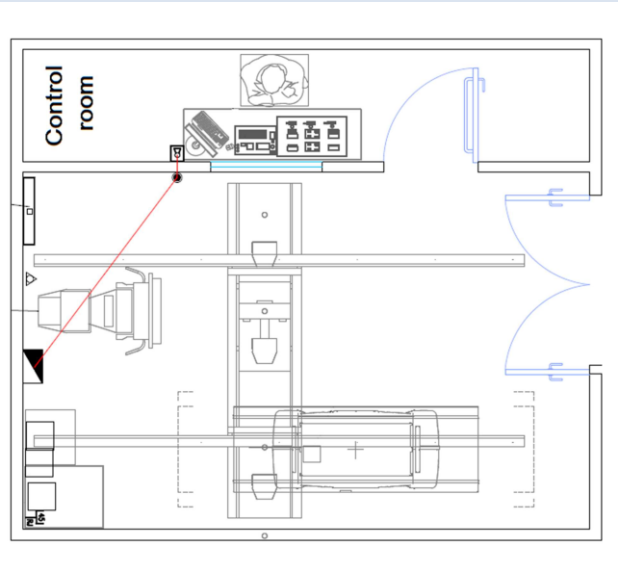
INSTALLATION DATA

Generator power supply	380 Vac +/- 10%, 50/60 Hz three phase
Workstation Power supply	230 Vac +/- 10%, 50/60 Hz single phase
Wall stand	DIMENSIONS: 93 x 139 (165 max) x 219,5 cm WEIGHT: 250 kg
Ceiling suspension	DIMENSIONS: 440 x 350 x 150 cm LONGITUDINAL RAILS: 440 cm TRANSVERSAL RAILS: 300 cm WEIGHT: 320 kg
Patient table	DIMENSIONS: 220 x 80 x 55 cm (BTE) - 220 x 80 x 75 cm (BT) WEIGHT: 250 kg (BTE) - 140 kg (BT)
Generator cabinet	DIMENSIONS: 55,9 x 40,6 x 123,7 cm WEIGHT: 107 kg
System cabinet	DIMENSIONS: 55 x 70 x 135 cm WEIGHT: 100 kg

ENVIRONMENTAL CONDITIONS

OPERATING	
Temperature Humidity Atmospheric Pressure	+15°C ÷ +35°C 30% ÷ 75% 700 mbar ÷ 1060 mbar
TRANSPORT AND STORAGE	
Temperature Humidity Atmospheric Pressure	0°C ÷ +50°C 20% ÷ 80% 500 mbar ÷ 1060 mbar

ROOM CONSIDERATION (TYPICAL LAYOUTS)



(*) Optional

ACCESSORIES

ACCESSORIES FOR BT/BTE HORIZONTAL BUCKY (*)

Compression band Handles (couple) Leg support (couple)		
Lateral wireless detector holder for lateral projection on lying patient.		

ACCESSORIES FOR VERTICAL BUCKY (*)

Accessory for stitching exams: it supports the patient during several expositions. With double footrest and optional compression band.	

(*) Optional

ACCESSORIES

ACCESSORIES FOR WIRELESS DETECTOR (*)

Wireless detector holder for weight bearing examinations		
Snap-on Grid System, including 80 lp/cm grid		

(*) Optional

ITALRAY reserves the right to make modifications without any prior notice.

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