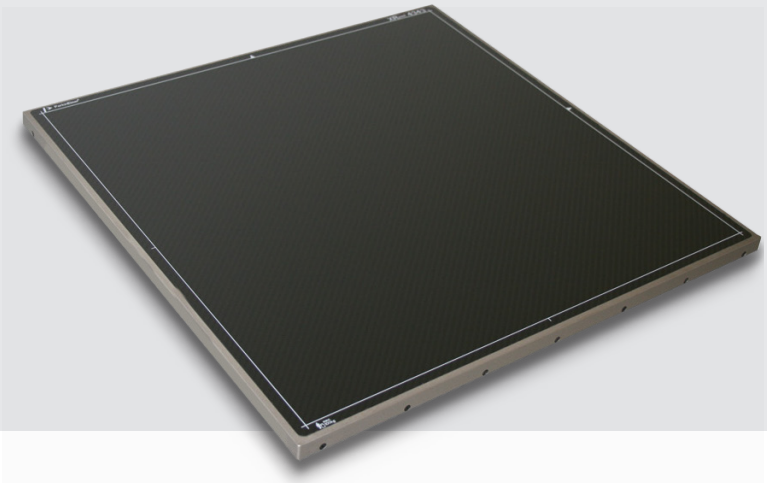
PRODUCT NOTE

XRpad 4343 F (in development)

Flat Panel X-ray Detectors



Features and Benefits

- Fixed configuration cassette detector
- True 43 cm × 43 cm (17" × 17") image
- High resolution 100 µm pixel pitch
- Up to 65,536 gray levels
- Automatic Exposure Detection (AED)
- Direct deposition CsI, for excellent image quality
- Imaging up to 8 fps

Applications[1]

- Digital radiography

Upgrade to Digital Radiography

Overview

The PerkinElmer XRpad™ 4343 F is a light weight, cassette-sized flat panel detector for digital radiography. It fits into a conventional table or wall-stand Bucky, just like a film-screen cassette.

Featuring a 18.7 million pixel image matrix, a best-in-class 100 µm pixel pitch, and a direct deposited CsI scintillator, the PerkinElmer XRpad 4343 F provides exceptional image quality. True 43 × 43 cm imaging area is provided, along with single-piece carbon-fiber construction for the front and back housing which allows for easier placement and cleaning. Automatic Exposure Detection simplifies integration.

We have over 20 years of experience partnering with customers to develop products in a wide range of X-ray applications. Let our digital imaging experience work for you.

PerkinElmer®
For the Better

XRpad 4343 F (in development)

Sensor

Panel	Single substrate amorphous silicon active TFT/diode array
Scintillator	Direct deposition CsI:Tl
Pixel Matrix	4318 × 4320
Pixel Pitch	100 µm

Electronics

Amplifiers	Low noise ASICs with user selectable gains
ADC	16bit
Image Transfer Time	Wired: 600 ms
On-board Memory	1 GB DDR3, 4 GB SDHC card

Mechanical

Size	43 cm × 43 cm (17" × 17") cassette size
Active Area	432 mm × 432 mm
External Dimensions	460 mm (w) × 460 mm (l) × 15 mm (h)
Weight	4.5 kg (9.4 lbs)
Housing	Carbon-fiber front & back

Communications

Wired Data I/F	GigE via power and communication tether
X-ray I/F	Integrated X-ray trigger control Automatic Exposure Detection

Imaging Performance

Limiting resolution	5 cy/mm
Typical MTF	70% (1 cy/mm), 40% (2 cy/mm), 15% (4 cy/mm) for RQA5
Typical DQE	75% (0 cy/mm), 60% (1 cy/mm), 40% (3 cy/mm) for RQA

Environmental

Temperature	10 – 35 °C operating
Humidity	30 - 70 % RH operating (non-condensing)

Accessories

Interface and Power Unit	XRpad IPU with external power supply 100 - 240 V AC, GigE, and X-ray I/F

Regulatory

Standards	IEC 60601-1, IEC 60601-1-2, IEC 60601-1-6, ETSI EN 301 893, EN 62311, ISO 10993-5, ISO 10993-10, CE

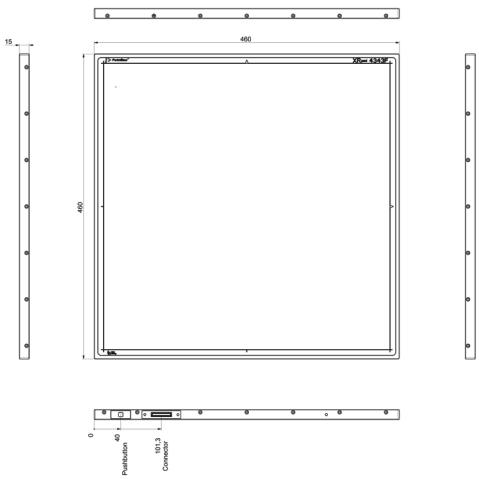
Customizable options

Sequence Mode	Up to 3 fps
Binned Mode	Up to 8 fps for 2 × 2 binned, 200 µm pitch for a pixel matrix of 2159 × 2160
Image Calibration	On-board offset, gain and defect pixel corrections
Fast Preview	4 × 4 binned quick preview image

1: Unless otherwise specified, PerkinElmer Flat Panel X-ray Detectors are components intended to be integrated into products by X-ray system manufacturers. System manufacturers are responsible for qualifying and validating their products for their intended uses and meeting all applicable regulatory requirements.

Contents in this document are subject to change without notice.

Mechanical Characteristics (Dimensions in mm)



USA
PerkinElmer, Inc.
2175 Mission College Blvd
Santa Clara, CA 95054 USA
P: +1 408-565-0796
F: +1 408-969-6493
fpd@perkinelmer.com
www.perkinelmer.com

Germany
PerkinElmer
Technologies GmbH & Co. KG
In der Rehbach 22
65396 Walluf Germany
P: +49 6123 971-300
F: +49 6123 971-600
fpd@perkinelmer.com
www.perkinelmer.com

United Kingdom
Dexela Limited
A PerkinElmer Company
Wenlock Business Centre
50-52 Wharf Road
London N1 7EU United Kingdom
P: +44 20 7148 3107
www.dexela.com
fpd@perkinelmer.com
www.perkinelmer.com

China
PerkinElmer, Inc.
No. 1670 Zhangheng Road
Zhangjiang Hi-Tech Park
Shanghai 201203, PRC
P: +86 21 60645611
F: +86 21 60645666
fpd@perkinelmer.com
www.perkinelmer.com

For a complete listing of our global offices, visit www.perkinelmer.com/ContactUs

011588_01

dicomPACS® DX-R
X-ray Acquisition Software

Acquisition and diagnostic software

for X-ray images from DR flat panels or CR systems in
human and veterinary medicine

dicomPACS® DX-R
X-ray Acquisition Software

Professional acquisition software for X-ray images

dicom**PACS*® ***DX-R is a professional acquisition software for X-ray images from flat panel systems (DR) and CR units (computed radiography with imaging plates) by any manufacturer. In addition, the software controls X-ray generators and X-ray units of various manufacturers, providing a smooth and systematic workflow. A simple and user friendly GUI (graphical user interface) operated by touchscreen or mouse completes the system.

The professional ***dicom**PACS*® ***DX-R*** image processing can be adapted to individual user needs and offers outstanding image quality in human and veterinary medicine. It has been specially developed to enable organ specific optimisation, guaranteeing the highest quality X-ray images.

Many helpful integrated functions such as the radiographic positioning guide and intuitive operation simplify daily routine tasks greatly.

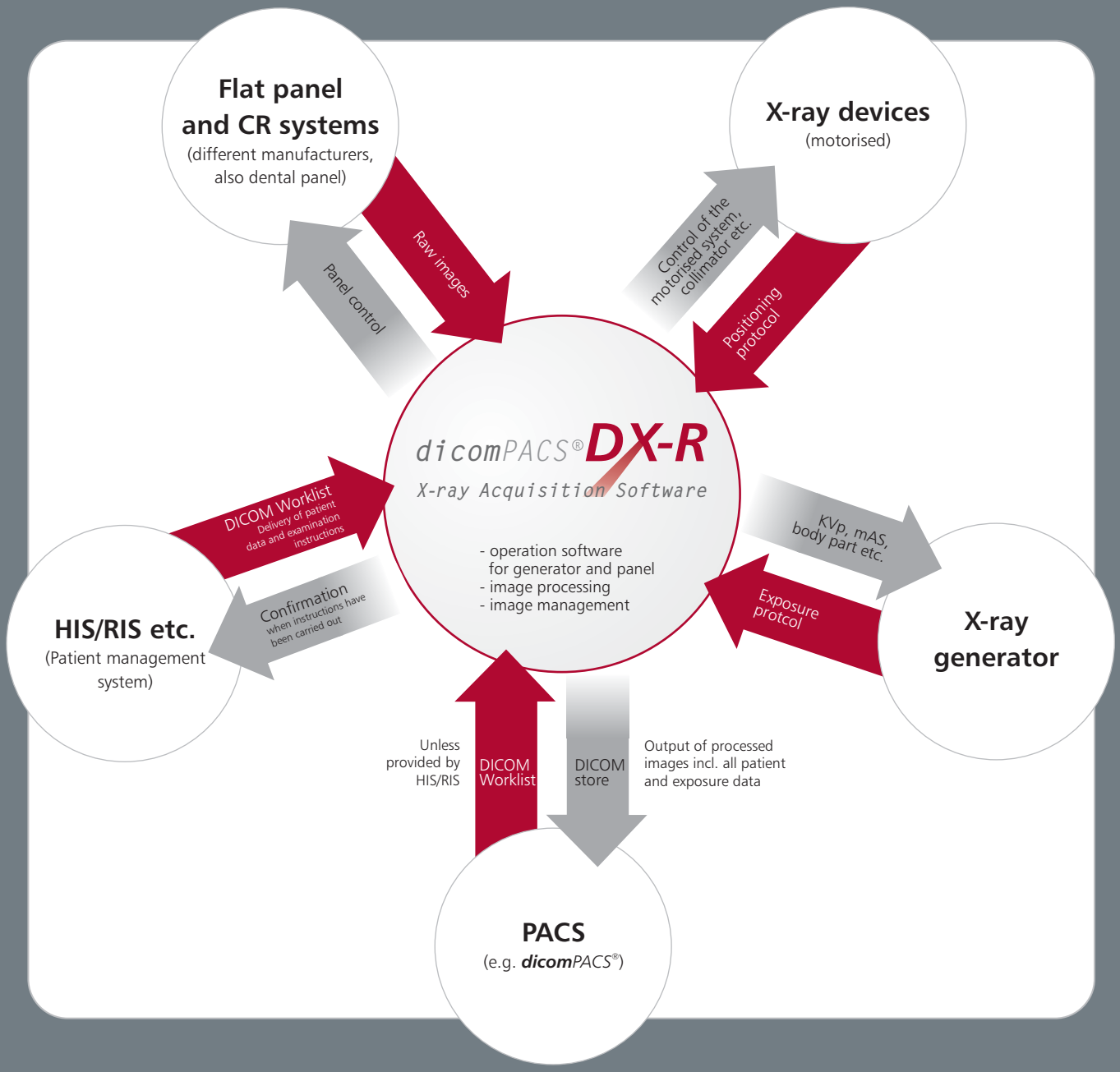
In addition, ***dicom**PACS*® ***DX-R*** allows integration with existing patient management systems. The integrated full ***dicom**PACS*® viewer even allows the user to diagnose X-ray images within the acquisition software. Therefore, the system can also be applied as fully-fledged diagnostic workstation with the option to upgrade to a PACS (Picture Archiving and Communication System).

dicom**PACS*® ***DX-R forms the core of a direct digital X-ray unit, whether it is a retrofit system to upgrade existing X-ray units, a complete new unit including generator control, or a portable suitcase solution for mobile X-ray generators.

Acquisition and diagnostic software for X-ray images

Function principles

*dicom*PACS® ***DX-R*** software



Benefits

User friendliness and smooth workflow

- Modern graphical user interface (GUI) adaptable to almost **any language**
- **Touchscreen** operation – to ensure quick and efficient work and a smooth workflow
- Capture of patient data via **DICOM Worklist, BDT/GDT, HL7** or other protocols – data may also be captured manually
- Use of **DICOM Procedure Codes** for the transfer of all relevant examination data directly from the connected patient management system (HIS/RIS)
- **Freely configurable** body parts with more than **400 projections** and numerous possible adjustments in **human and veterinary medicine** already included
- Safe and fast **registration of emergency patients**
- Allows the user to **switch between examinations** of a patient, for instance to avoid having to re-position the patient frequently
- Allows the user to **subsequently add images** to an examination, even after that examination has already been completed
- Special tools for veterinary medicine, such as an extra dialog box for patient and owner data, integrated **hip dysplasia measuring, special image filters, multi generator operation** for alternating between mobile and stationary X-ray systems and much more…
- Entry of recurring **examination procedures as macros**, e.g. thorax screenings or pre-purchase examination for horses
- **Fully integrated radiographic positioning guide** for each examination in human and veterinary medicine incl. comprehensive notes, photos, videos and correct X-ray images
- Option to control a digital X-ray system via **wireless remote** incl. display of the worklist, preview of the image taken for checking and much more

Screenshots

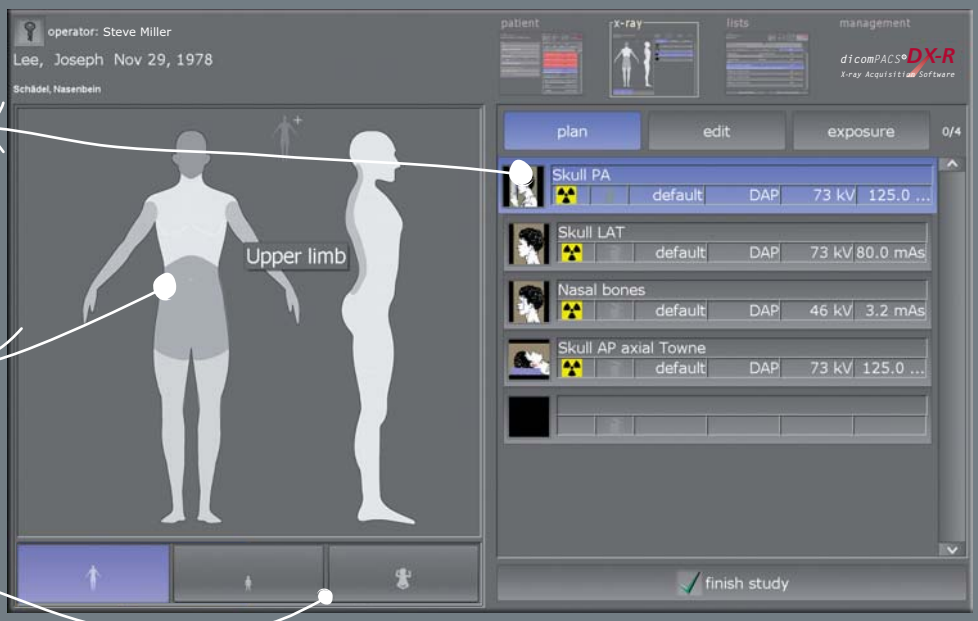
dicomPACS®***DX-R*** software

Job creation

The correct settings for adults and children – or for horses, dogs and cats – are available at a mouse click

Chart for the planning of an individual X-ray job

Switch to the planning of X-ray jobs for children and babies



Radiographic positioning guide

Video with sound for the step by step positioning of the patient

Shows an example of a correct X-ray image

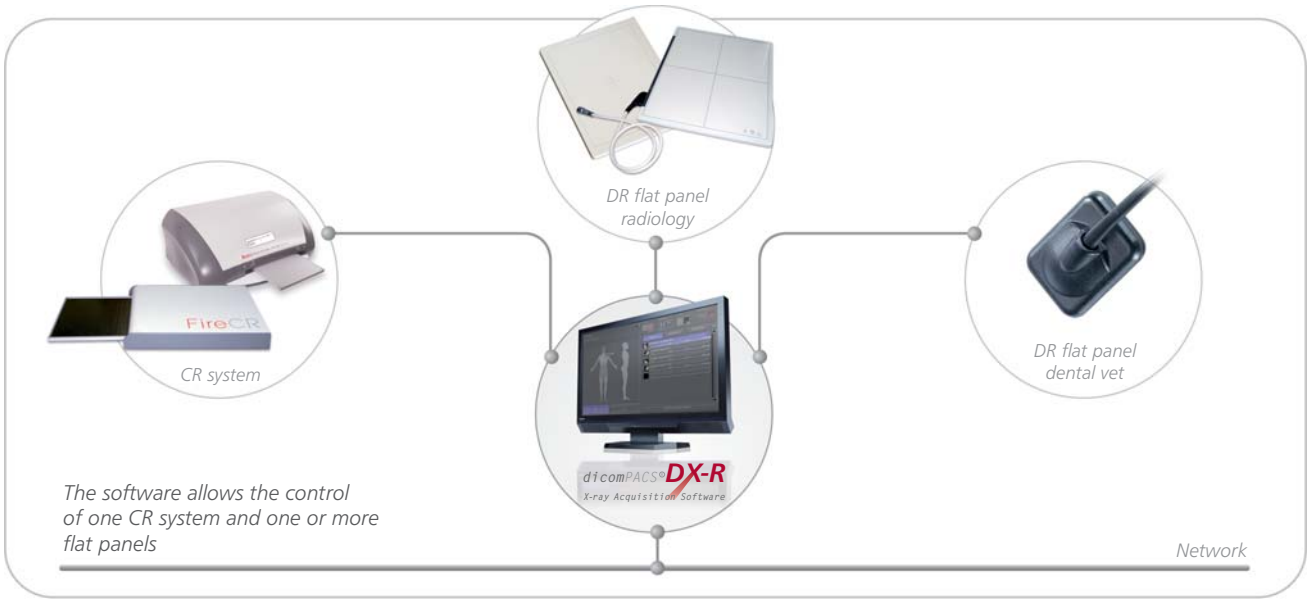
Presentation of helpful hints for the positioning of the patient, central beam, tips and tricks, frequent errors etc.

Opens examples of inaccurate X-ray images with comments

Benefits

Flexible image acquisition

- Integration of various **flat panel and CR systems** by different manufacturers
- Option to **connect up to 3 flat panels** (bucky, wall stand and mobile) to one system
- The **configurable generator interface** enables the user to control X-ray generators or X-ray systems by different manufacturers, delivering the generator settings directly from the software
- Option for the **parallel operation of a flat panel and a CR system** included in the standard package. The user has the choice to take the next image with either the flat panel or the integrated CR system. This flexibility also provides an **excellent emergency concept** in case of a defect flat panel.



The software allows the control of one CR system and one or more flat panels

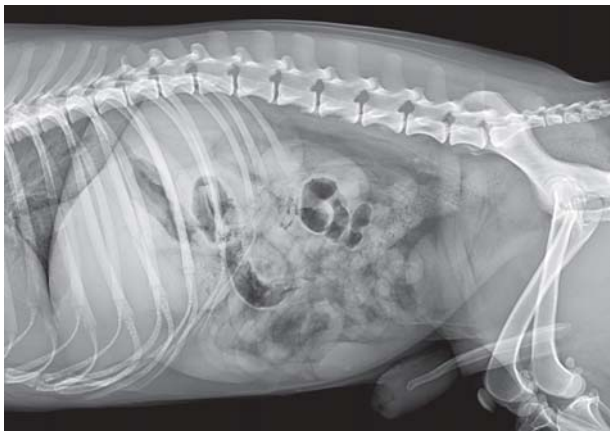
- **AEC** (Automatic Exposure Control) and **ARP** (Anatomical Programmed Radiography) allow the user to **automatically adjust all X-ray options** for each projection with an option to subsequently edit the image manually
- Integration of **dose area product meters** (DAP) – the readings are saved directly to the relevant image
- Electronic X-ray log

Benefits

The professional ***dicom****PACS*®***DX-R*** image processing

- Perfect images at all times – generally **no adjustment** required
- Integrated software for **automatic image optimisation**
- Professional, **adaptable image processing** for each individual examination to obtain best possible image settings for the needs of each customer
- Due to specially developed processes, the image processing allows the user to **vary the X-ray settings on a large scale** while the image quality remains virtually the same (**possibility of reducing the dosage**)
- **Bones and soft tissue** in one image – this enables the user to significantly improve his diagnosis
- **Details of bones and microstructures are very easy to recognise**
- Noise suppression
- **Black mask** (automatic shutters)
- Automatic **removal of grid lines** when using fixed grids

Exposure with
standard *image processing*



Exposure with
dicom*PACS*®***DX-R*** *image processing*

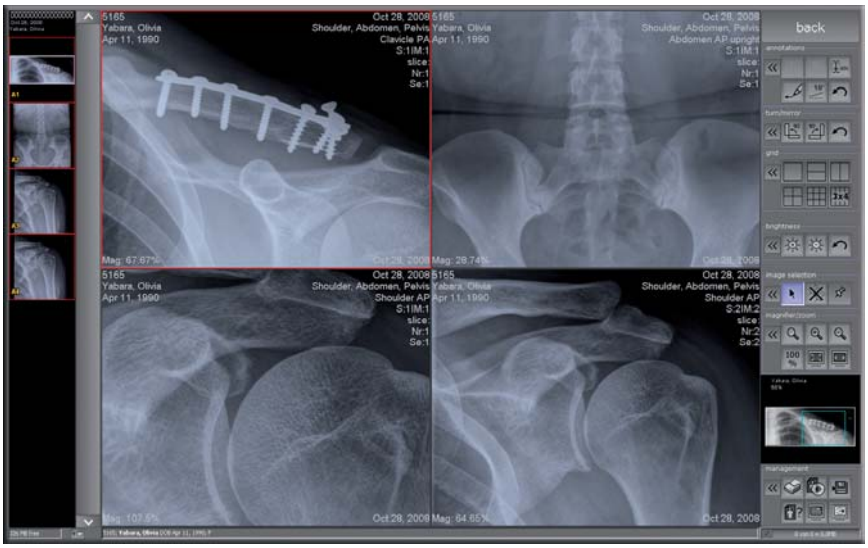
Exposure with
***standard** image processing*

Exposure with
***dicom**PACS®**DX-R** image processing*

Benefits

Outstandingly sophisticated image diagnosis

- Completely integrated ***dicom**PACS*® **viewer for image diagnosis**, further processing and storage of images in an SQL database incl. image manipulations, export options, layout adjustments, freely configurable user interface and much more
- Stepless **zoom, PAN, magnifyer, ROI, crop, rotate, mirror** etc.
- Insertion of **image annotations**, e.g. free texts, arrows, ellipses etc.
- **Measuring** of distances, angles, areas and density



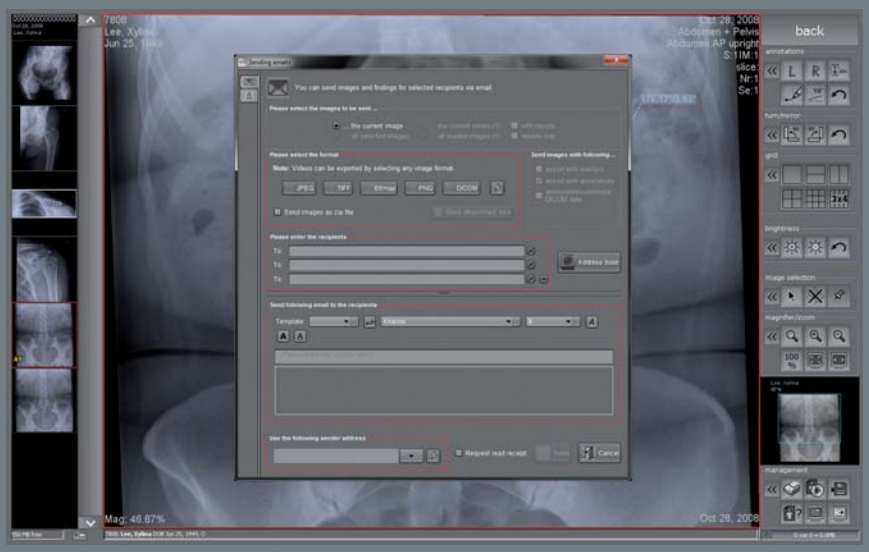
*Completely integrated **dicom**PACS® viewer for image diagnosis*

- **Special purpose tools for the veterinarian** (Specialised filters for the optimised depiction of bones and soft tissue, measurements for **TPLO** and **TTA**, **MMP, distraction index** determination, **cardiac measurements** etc.)
- Adjustment of window/level options and **gamma correction**, sharpening filters, noise suppression
- Many additional functions such as **chiro tools,** calculation of **Cobb's angle, HD measurements, pelvic obliquity measurements, integrated capturing of diagnostic reports** etc.
- Easily upgradable to the **integrated image management system** (PACS)

Benefits

Image export

- **Export of images** to JPEG, TIFF, BMP and DICOM formats
- Printing of images both on Windows printers and laser imagers via **DICOM Basic Print**
- Creation of **DICOM patient CDs** with free **WEB viewer**
- Inbuilt **e-mail tool** to image distribution - no external Email application necessary



E-mail tool

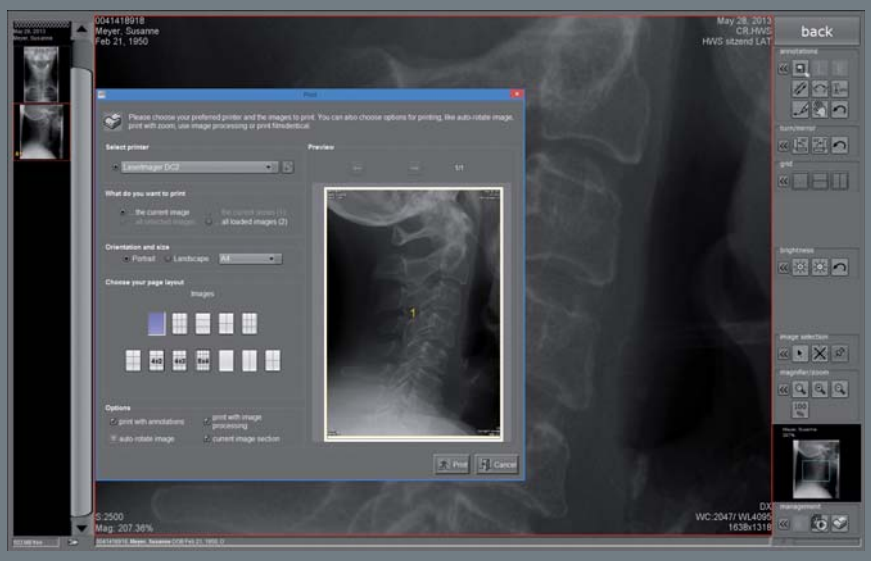
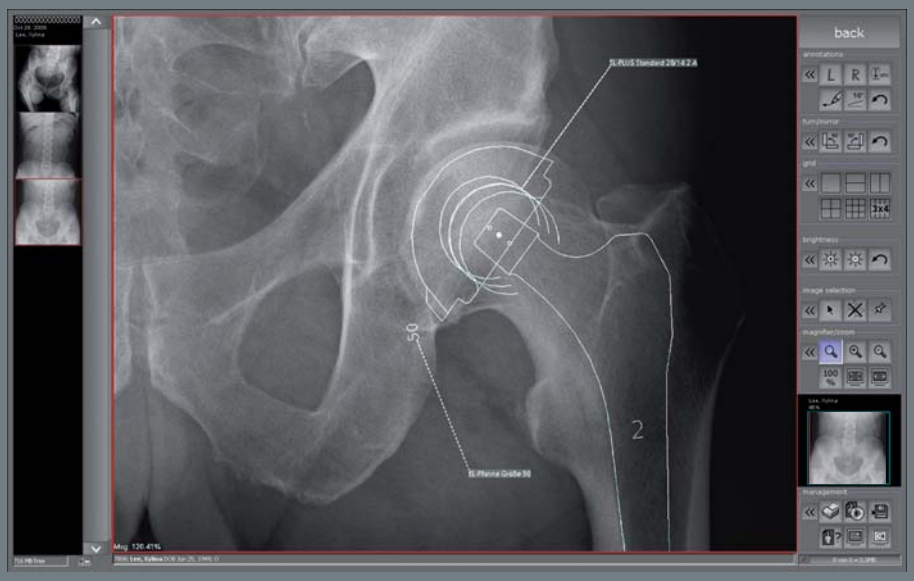


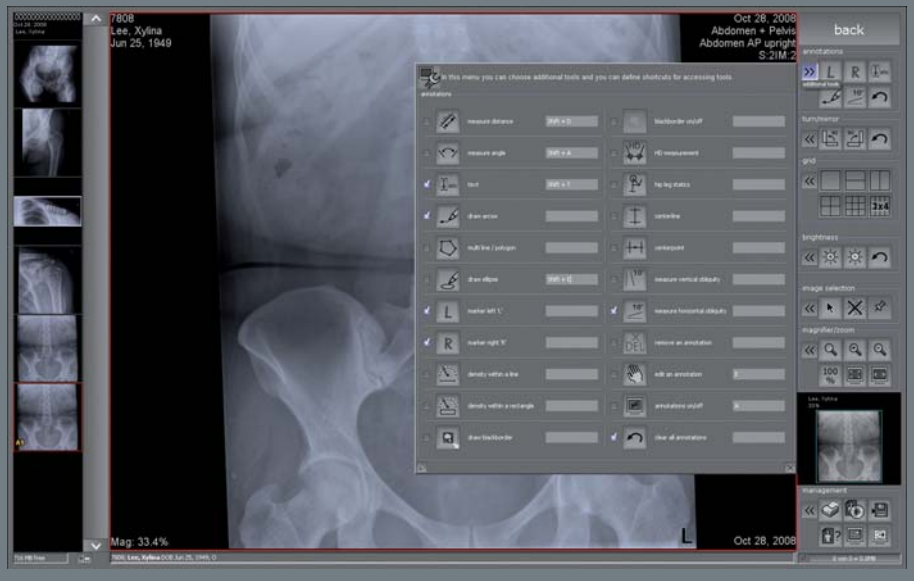
Image print

Integrated viewer

Completely integrated ***dicom****PACS*® viewer for image diagnosis



An integrated prosthesis documentation module provides preoperative planning (optional).



The system enables fast and easy customisation of the operating interface for individual customer preferences.

Useful tools such as the configurable measuring magnifier make diagnosis much easier.

The stitching module merges a number of separate digital X-ray images into a single image.

Comprehensive search tools enable the comparison of X-ray examinations of one or more patients.

Cloud-based

Digital access and archiving of images and diagnostic reports via Internet

***ORCA* - the Cloud-based archive and teleradiology solution by OR Technology**
Even for state-of-the-art practices and hospitals, the rapidly rising data flood of digital images, diagnostic reports and other documents is becoming increasingly challenging. Current legislation demands safe and long-term storage of patient data which generally requires investing in expensive hardware infrastructure as well as maintenance and corresponding staff costs.

To this end, we developed the ***ORCA*** Cloud archiving solution, thus paving the way for cost-effective and safe Cloud-based data archiving in practices and clinics. ***ORCA*** offers two application options:

- → Safe, long-term archiving of patient data with intelligent usage of internal databases
- → Communication platform (exchange of images and diagnostic reports) with colleagues and specialists or as an easy way to forward image data to patients (an alternative to creating patient CDs)

Data is **exclusively** archived on European servers with the relevant safety certificates.

Benefits of Cloud archiving through *ORCA*

Minimal expenditure: *ORCA* does not require investing in expensive infrastructure such as server and data cables.

Scalability: The amount of memory required when using ***ORCA*** is determined by the demand.

Long-term security: *ORCA* archives data on many individual European servers in professional and air-conditioned data centres. Server technology is continuously updated.

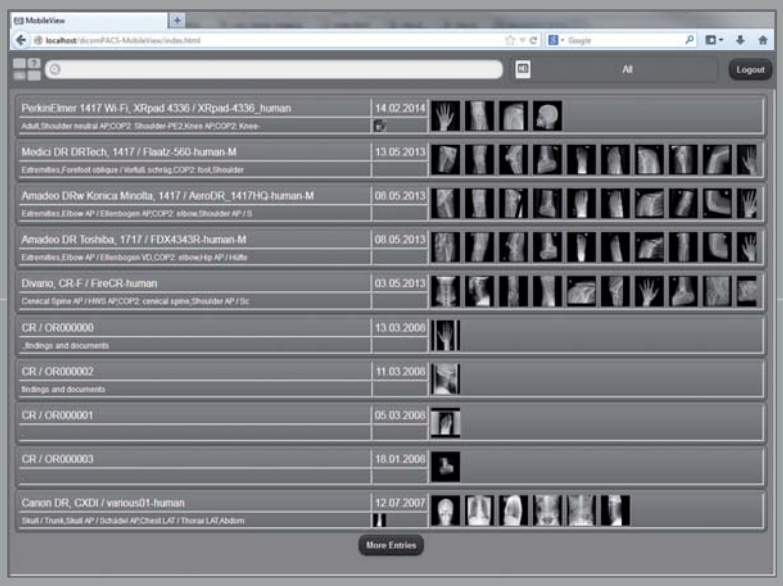
Accessibility: *ORCA* stands out by being highly accessible. Since data is saved with multiple redundancy, ***ORCA*** guarantees more continuity than a mere server solution.

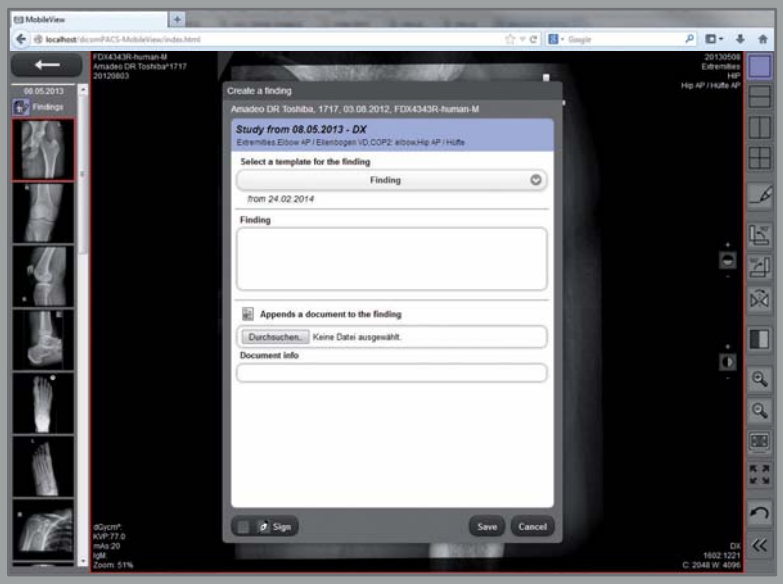
Environmentally friendly: *ORCA* is sustainable – through the optimised use of resources and their distribution.

Location-independent: *ORCA* guarantees access to archived patient data - worldwide.

Simplicity: *ORCA* allows easy access to data from any computer – from your place of work, from the comfort of your home or from any other computer or tablet PC.

Stress-free: *ORCA* deals with everything – no need to struggle with loose network cables, removed hard drives or software problems.





Features of *ORCA* online viewer:
The web-based viewer offers an important range of functions of a professional PACS viewer:

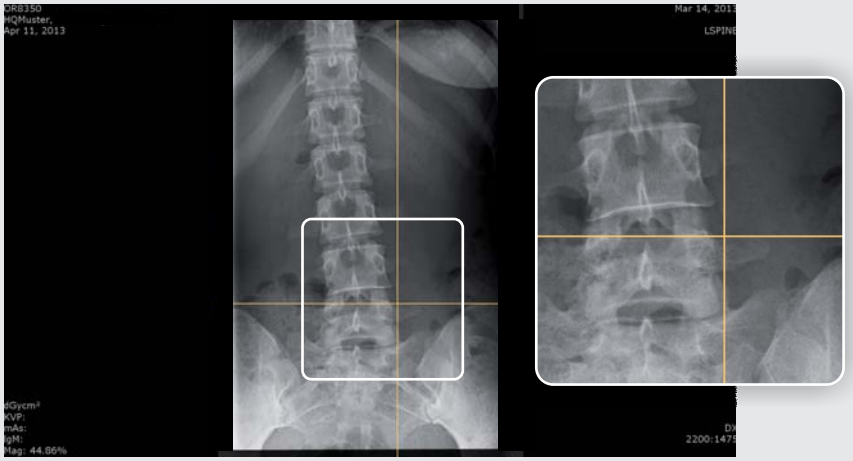
- Drawing of annotation
- Performance of measurements
- Registration of diagnostic findings
- Drawing Lines and Arrows (multi-colored)
- Image comparison by choosing different grids
- Flip and rotate images
- Adjust brightness/ contrast
- Invert, zoom in/ out
- Full screen, fit image
- Pan
- Scroll through image series
- Cine loop for multi-frame series and CT/ MRI

Special Chiro Tools

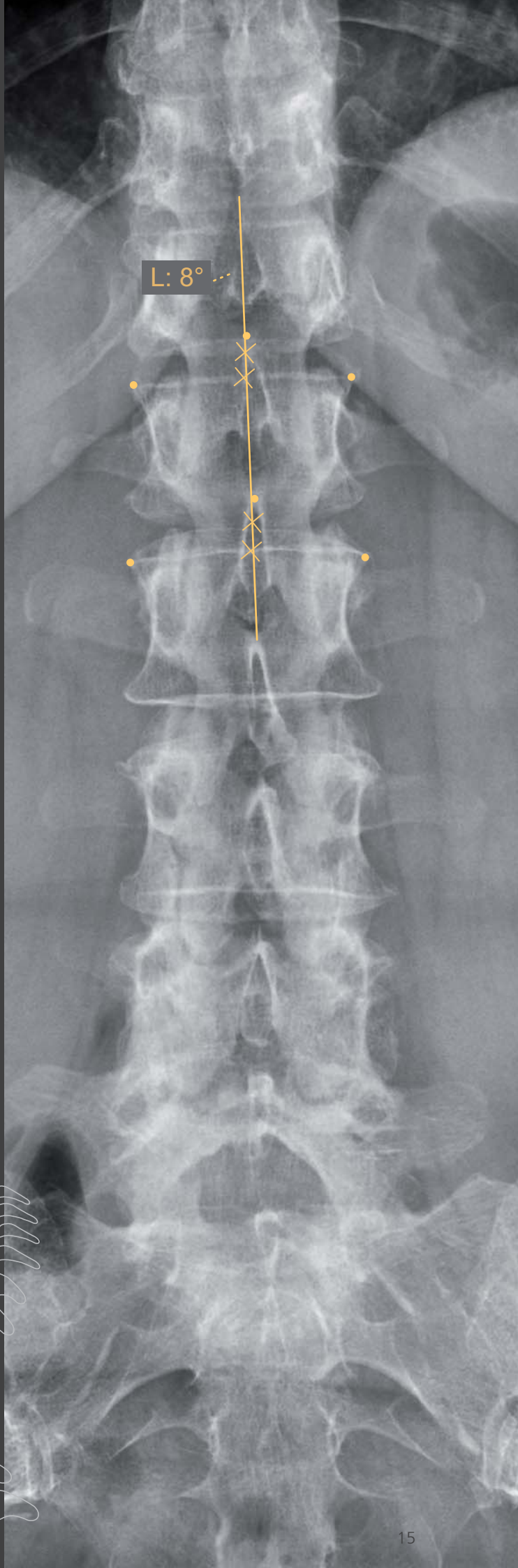
Diagnostic tools for optimal diagnosis

The Chiro Tools have been developed in cooperation with experts from the USA and Canada and offer great possibilities for diagnosing accurately as well as for planning further treatment. According to the tool used, automated center lines and points, defined curves, angle measurements etc., are generated after the manual selection of the points of interest.

Axis line
The tool creates a vertical or horizontal axis by holding down the left mouse button, depending on the direction, in which the mouse pointer is moved.



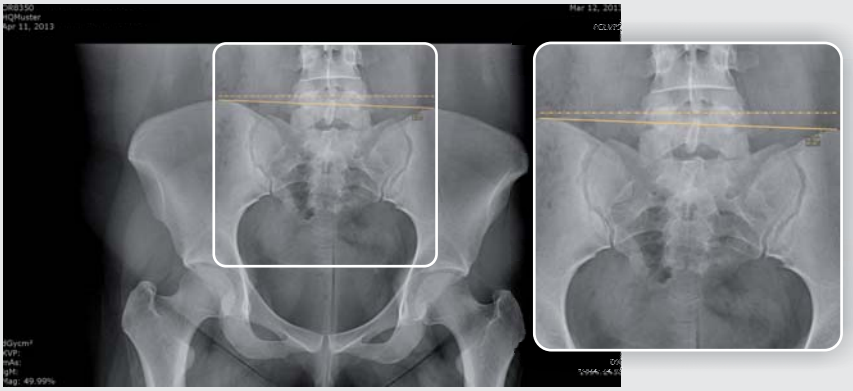
Orthogonal line
This tool is used to mark perpendicular lines on existing or yet to be drawn baselines. Furthermore the aberrancy of the x/y-axis (nearer axis) is displayed by default.


L: 8°

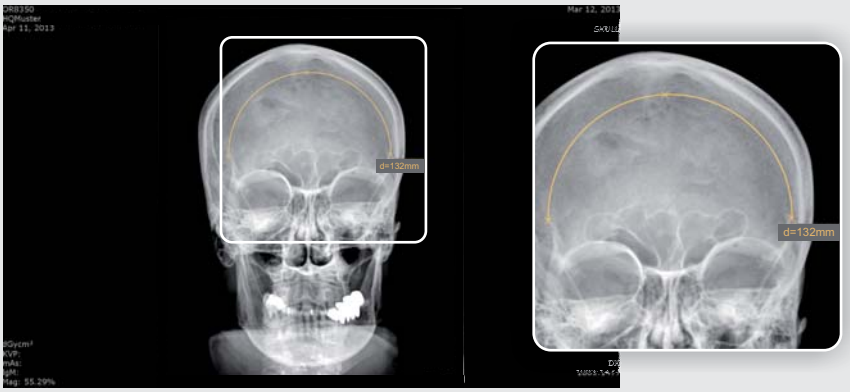
Chiro tools

George's line
This tool is used to draw vertical lines on each vertebra along the spine in a lateral view and to calculate their distances (in mm).

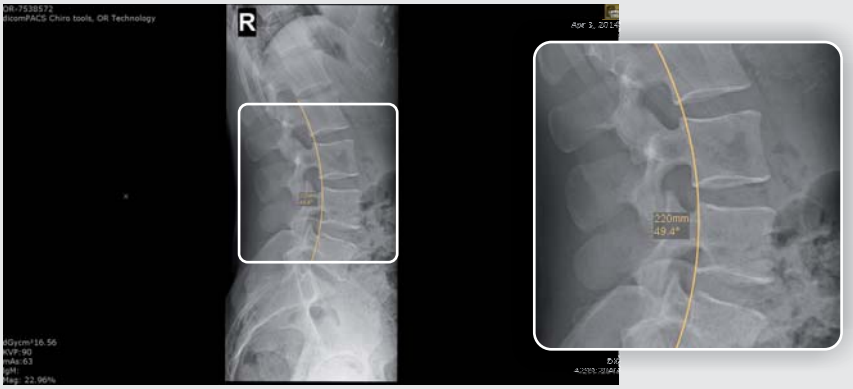
Horizontal or vertical aberrancy
This tool calculates the horizontal or vertical aberrancy to the horizontal or vertical axis. By default the nearer axis is used for the calculation of the aberrancy.



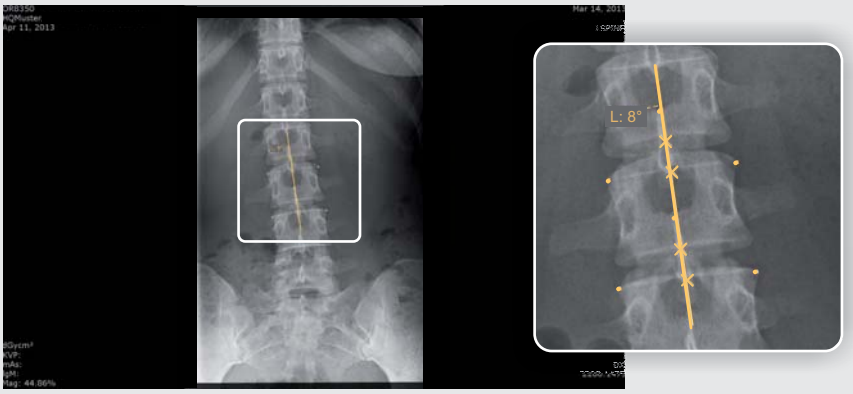
Circumscale
Circumscale is a measurement tool used on a nasium/frontal view. An arc is drawn through three defining points and the diameter of the corresponding circle is displayed by default.



Spinal curve
This tool is used to draw an arc in the lateral view of the spine. The annotation uses a fixed radius set by default to 220 mm. The tool consists of three points which indicate the lumbar curve with reference to the standard and the aberrancy, calculated in mm and degree.



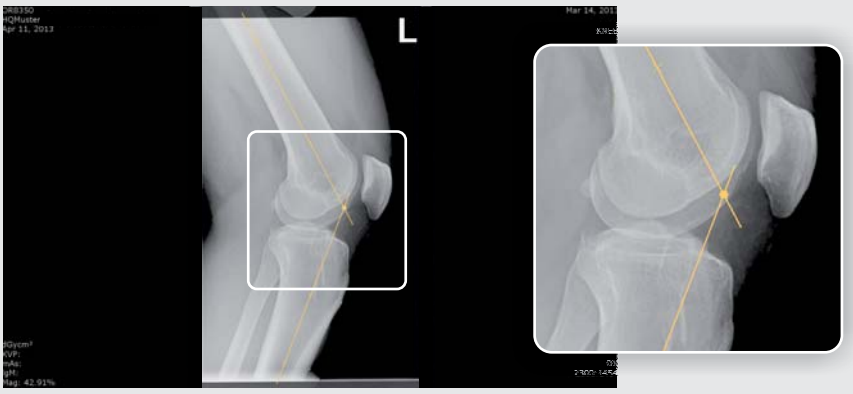
Vertebrae line
This tool generates a vertical line of six points (2x3) along the spinal canal and displays the lateral aberration in degrees.



Center point
This tool calculates the center point in order to define a precise axis.

Distance comparison
This tool compares the distances between three set points (between point 1and point 2 and between point 2 and point 3).

Mark intersection
This tool marks the intersection of two intersecting lines. The default display of the intersection is a filled dot.



Special functions

for veterinary medicine

Digital X-ray images have the advantage that exact measurements can be taken at the monitor and the image quality can be improved by a number of manipulations. ***dicom****PACS*® ***DX-R*** now offers some special functions.

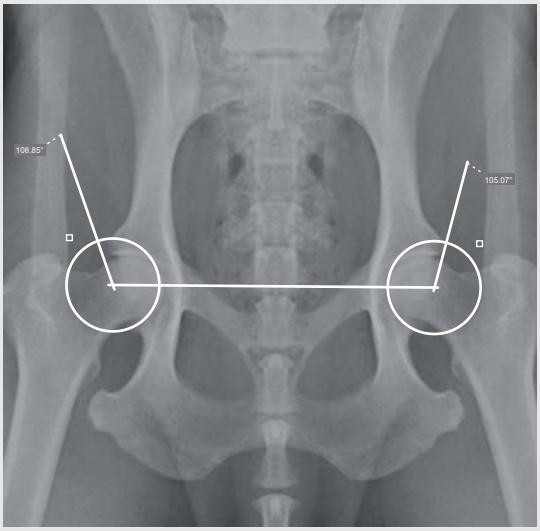
MMP (Modified Maquet Procedure)

The MMP (Modified Maquet Procedure) is a method of measurement for dogs with a cruciate ligament disorder, in which the distance for the placement of the MMP Wedge is determined. Since angles and lines are calculated automatically, determining the wedge size only requires a few steps.

For this annotation we created an illustrated annotation guide with a help text indicating the correct step-by-step method of the measuring procedure. If lines or dots were placed inaccurately, corrections can be made throughout the measuring process by means of the Alt key.

HD measuring technique for dogs

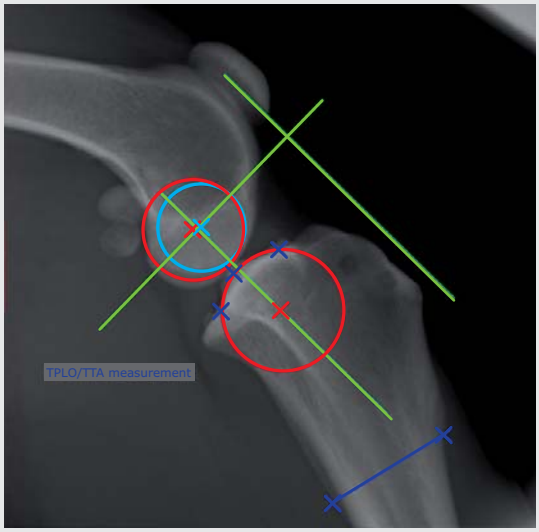
Hip dysplasia (HD) as a progressive fault in the hip joint is undoubtedly a common problem for the veterinarian, especially because the larger races are affected by it in particular. X-ray examination is a reliable way of judging the severity of the condition. A precondition for a meaningful diagnosis is the exact placing of the examined animal in a supine position with parallel extended femurs, the kneecaps turned in to line up with the direction of the X-rays. Additional exposures can be made with the femurs in a "frog position" or sideways (latero-lateral) to the X-rays. The Norberg Angle is an important assessment criterion. It is defined as the angle described between the centre of the femur head and the front edge of the socket.



TTA (Tibial Tuberosity Advancement)

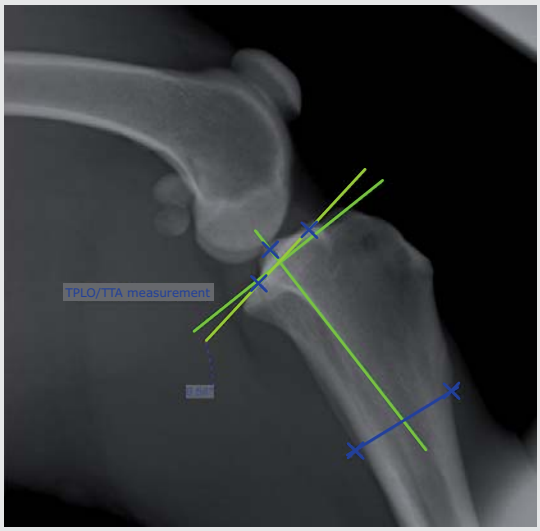
The TTA measuring technique for treating crucial ligament ruptures in dogs is one of the numerous functions of ***dicom****PACS*®***DX-R***.

When applying TTA (Tibial Tuberosity Advancement) as opposed to TPLO, osteotomy is applied to the non-load-bearing part of the tibia. Accordingly, the TTA measuring tool is used to apply the translated length measurements at the tuberositas tibiae.



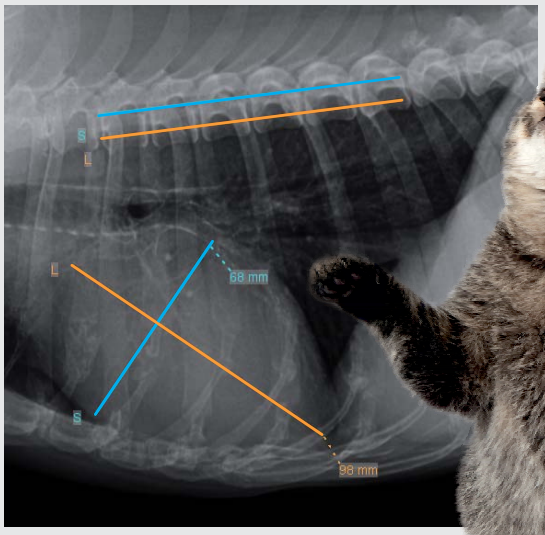
TPLO (Tibial Plateau Leveling Osteotomy)

It was necessary to implement this function, since crucial ligament ruptures in dogs are increasingly treated by changing biomechanics, using osteotomy – an operation procedure involving precision cutting through the bone and securing it in a changed position by means of plates and screws, with a view to permanently correct displacements. The TPLO measuring tool helps to determine the existing slope of the tibial plateau and its theoretical optimization. The TPLO provides the surgeon with a promising method to treat crucial ligament ruptures in dogs, allowing the patient to walk again without any pain within a short period after the operation.



Buchanan's Vertebral Heart Score

It has been designed specifically for cats and dogs. The height and width of the heart are put into relation to the individual animal's vertebral body width. Therefore, racial distinctions are brought to bear on the examinations results. The Vertebral Heart Score (VHS) is measured by the long axis (L) and the short axis (S) which are transposed onto the vertebral column and recorded as the number of the vertebrae beginning with the cranial edge of T4.

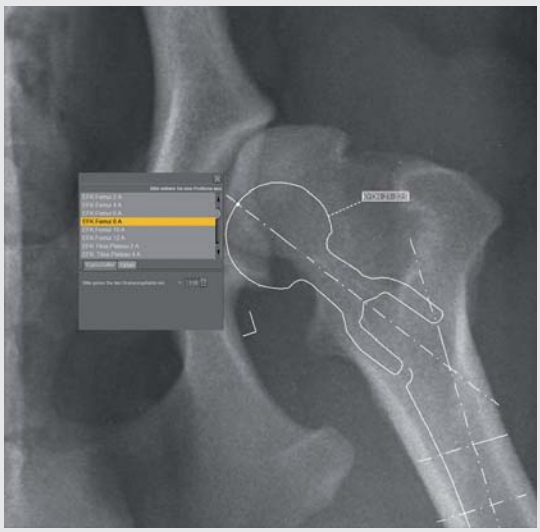


Special function for veterinary medicine

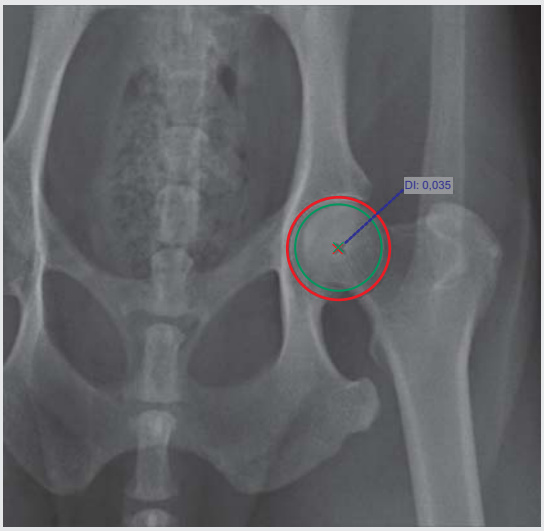
Prosthesis documentation module
There are two options to plan an operation with prosthesis templates:

1. Planning and/or documenting operations by digitised prosthesis templates do not require a film identical image display. The prosthesis template is simply selected from a set of templates and displayed in the image as an annotation.

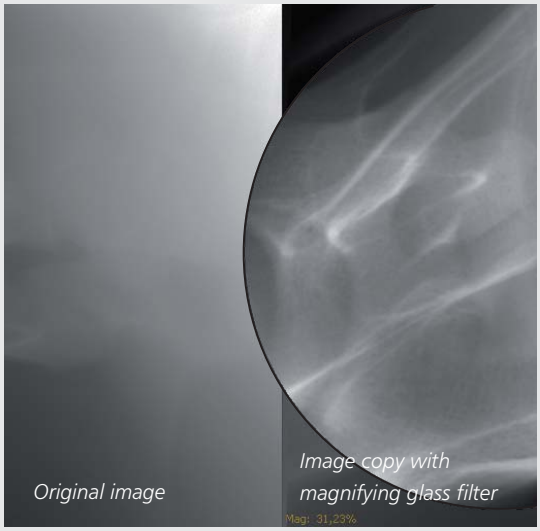
2. Planning with existing transparency prosthesis templates (provided by the manufacturers) requires a film identical image to be displayed on the monitor in the same size as an equivalent analogue X-ray image on film.



Measuring the distraction index
The distraction index measures how loose the hip joints are and is thus an important measuring instrument to assess hip dysplasia.
The distraction index serves to determine the displacement of the femoral head from the joint socket of the hip joint. This measuring function provides an easy tool for veterinary medicine to assess this displacement.



Special filter for the optimization of bones and soft parts
Image manipulation of conventional image processing systems is usually limited to brightness/contrast (Window level), dynamics or image sharpness. The disadvantage lies in the fact that changes always affect the whole image. This has the effect that special details do not become better visible without changing the whole image. In addition the manipulations do not accommodate the specific image quality in different regions of the X-ray image. For the best possible visualisation of details, the digital qualities of just the Region of Interest (ROI) should be electronically modified.




Modified Maquet Procedure
1.4mm

Modalities

Which flat panels and CR systems does ***dicom**PACS*®***DX-R*** support?

dicom**PACS*®DX-R*** is a generally open system. Its conception and development was independent of hardware manufacturers.

Components from the following manufacturers have already been integrated (We are continuously working on the integration of new models and manufacturers):

Flat panel

ATLAIM

CARERAY

DR TECH

奕瑞影像

Kodak | Dental Systems

KONICA MINOLTA

PerkinElmer

RAYENCE

SAMSUNG

THALES

TOSHIBA

VARIAN medical systems

CR systems

3DISC

Carestream HEALTH

Generator control

The generator screen displays all recommended values and settings (kVp, mAs, focus etc.). These settings may be adapted to the system used.

Extension

Options for upgrading ***dicom****PACS*®***DX-R***

The stitching module merges a number of separate digital X-ray images into a single image. You can load, correctly align and merge any number of original images.

dicom*PACS*®***DX-R*** may not only be used as a software for the acquisition and processing of X-ray images, but can also be upgraded to a MiniPACS or even to an Enterprise Multi Modality PACS. Thousends of installed workstations in over 60 countries (as of 4/2014) prove that our customers are satisfied.

A single workstation system with installed ***dicom****PACS*®***DX-R*** software can be upgraded with the following options (extract):

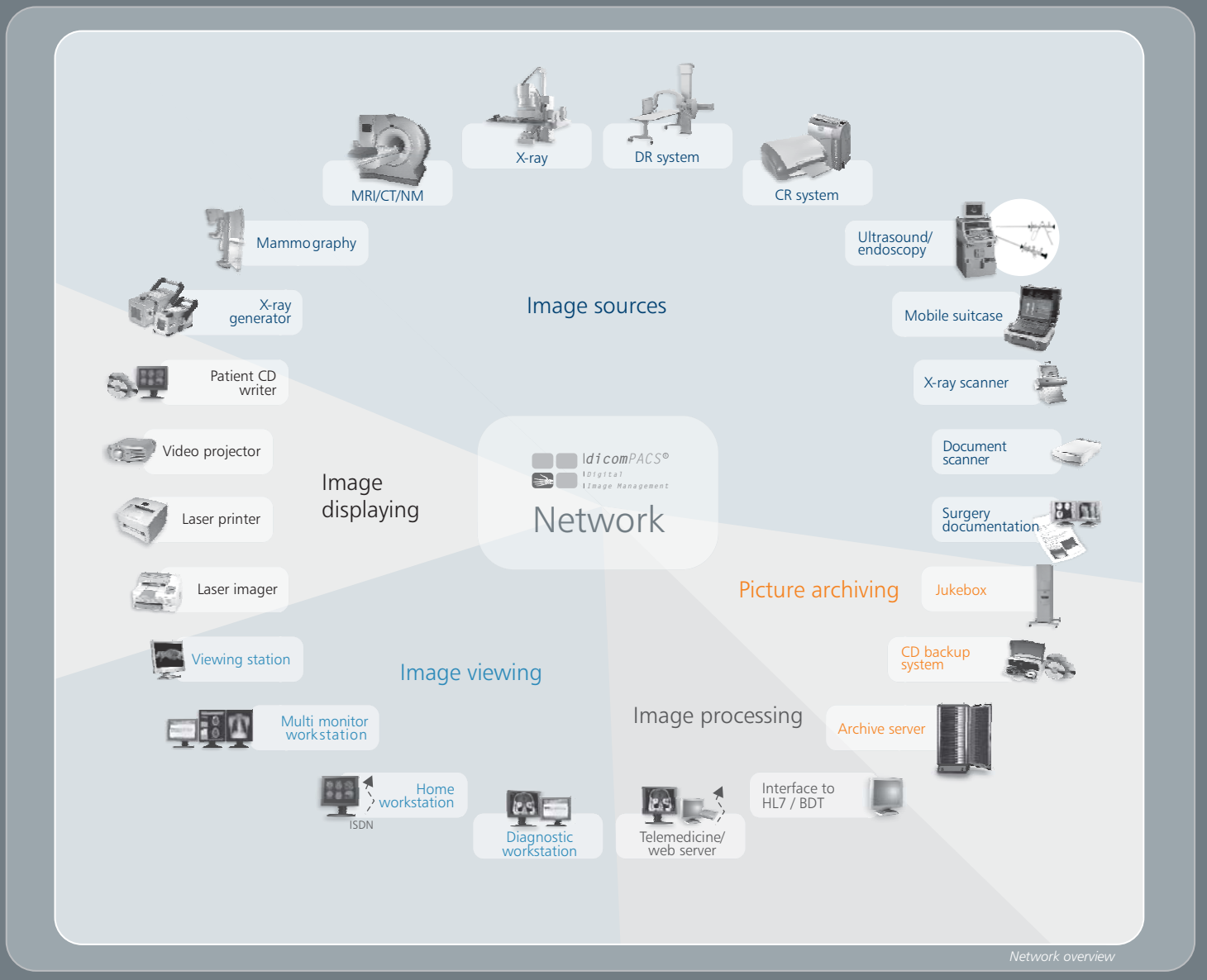
Further optional viewer functions:

- May be installed on **Apple MAC and Linux** systems
- Generation of full leg/full spine images **(Image stitching)**
- Preparation of diagnostic reports with integrated images in MS Word
- Connection of several diagnostic monitors
- Capturing of additional patient and examination data with their freely configurable **statistical analysis**
- Working with **digital prosthesis templates for surgery planning** and documentation - Prosthesis templates can be selected from a set and inserted into the image as annotations
- Additional radiological functions such as Maximum Intensity Projection (**MIP**), Multiplanar Reconstruction (**MPR**), hanging protocols and mammography tools
- Fast and easy preparation of **equine pre-purchase examinations** with automatically inserted X-ray images (only for Germany)
- And much more…

Extension

Upgrade to an integrated multi-modality PACS

- **DICOM reception** from any DICOM sources, e.g. CT, MRI, scintigraphy, ultrasound etc
- **DICOM distribution** with freely configurable rules
- **DICOM DIR import** for archiving patient CDs by other manufacturers
- **DICOM Query/Retrieve** (SCP/ SCU)
- DICOM Auto **Pre-fetching**
- **DICOM Print Server** to convert DICOM Basic Print into Windows print jobs
- **DICOM Compression** according to freely configurable rules
- DICOM CD/DVD Backup Module, also via robot systems
- Integration of **film and document scanners**
- Digitalisation of standard and non-standard video signals, e.g. **endoscopy, angiography** etc.
- Fully automatic **synchronisation** of two image databases, e.g. laptop and main archive
- **Exchange of images and diagnostic** reports between individual clinics by means of teleradiology
- **MobileView**: distributes images within a hospital and displays the images in a web browser
- **ORCA cloud-based solution**: enables worldwide image distribution to referring doctors and patients via the internet



Network overview

Version 006_03_2014

Portfolio

Overview - products of OR Technology

Medici DR Systems

DR retrofits - digital upgrade set for existing X-ray systems incl. ***dicom**PACS*®***DX-R*** acquisition software, also available for stationary and mobile X-ray machines

Leonardo DR Systems

DR suitcases - compact suitcase solutions for portable X-ray incl. ***dicom**PACS*®***DX-R*** acquisition software

Amadeo X-ray Systems

Complete digital X-ray systems (incl. stand, bucky, generator, flat panel incl. ***dicom**PACS*®***DX-R*** acquisition software etc.) as well as mobile and portable X-ray solutions

Divario CR Systems

CR solutions - CR systems for digital X-ray with cassettes incl. ***dicom**PACS*®***DX-R*** acquisition software

X-ray Accessories

Accessories for X-ray
(e.g. radiation protection walls, gloves etc.)

dicomPACS®

Image management (PACS) - comprises acquisition, processing, diagnosis, transfer and archiving of image material

ORCA

Cloud-based archive solution - safe, long-term archiving of patient data with intelligent usage of internal databases, communication platform with colleagues and specialists and transfer of image data to patients

dicomPACS® DX-R

X-ray Acquisition Software

X-ray acquisition software [only for OEMs] - acquisition and diagnostic software for X-ray images from flat panels or CR systems

OR Technology
Digital X-ray and
Imaging Solutions

Info hotline: +49 381 36 600 600

OR Technology (Oehm und Rehbein GmbH)
18057 Rostock, Germany, Neptunallee 7c
Tel. +49 381 36 600 500, Fax +49 381 36 600 555
www.or-technology.com, info@or-technology.com

[Stamp of distribution partner]