

# NDR + Spot film and angiography digital video system

**NDR digital video system series**

The new NDR+ system has been designed to bring high resolution digital imaging CCD technology to all routine examinations in a remote R/F room and C-Arm system. The NDR+ uses a new CCD camera with a progressive scan sensor of 1Kx1K with integrated optical system and neutral density filter for spot radiography. The system can acquire and display 25 frames/sec at full resolution 1024x1024. Acquisition is made at 12 bits resolution to use the FULL dynamic range of the CCD camera. A very important new feature is DRF (Dynamic Recursive Filter) which allows pixel by pixel shifting of the recursive filter. This type of filter offers better photonic noise reduction, eliminating also image persistence during patient movement. Another important feature is the new 9x9 kernel algorithm which produces more levels of edge enhancement.

The NDR+, using digital technology acquires, enhances, stores and formats multi image case studies. The exams can be converted to DICOM 3.0 and can be sent to a PACS network, to a DICOM printer or they can be recorded to a CD or DVD. The NDR+ digital system also accepts a work list mode so it can acquire patient data from the hospital RIS. A laser printer interface is available to produce hard copies if the R/F or C-Arm system does not have the DICOM net.



The new NDR+ series can be equipped with an on-line 140 Gigabytes Ram memory: based on state-of-the-art new hard disk generation, with proprietary very fast disk controller, the NDR+ direct access RAM-DISK is capable to recording and reproducing, without any compression, images with 1Kx1K pixels at full speed of 25 f/sec.

Based on a new Pentium™ processor architecture the core computer is equipped with a new improved software with easy operation and user friendly interface which gives the user complete control of the machine features: starting from control system interface of the x-ray generator and the machine functions to patient, image, measure, and study data base management.



## Main features

### CCD HEAD CAMERA

- ❑ CCD camera 1Kx1K with square pixels
- ❑ Acquisition A/D 12 bit resolution
- ❑ Electronic AGC with neutral density filter
- ❑ Progressive scanning
- ❑ Frequency: 66MHZ
- ❑ Signal to noise ratio: > 67dB

### CCU RACK (ACQUISITION & PROCESSING UNIT)

- ❑ HD processor dedicated to manage images 1024x1024 12 bit at 25 f/sec
- ❑ INTEL™ processor for the user interface
- ❑ INTEL™ 1,6GHz 1 Gb RAM for DICOM 3.0 interface processor
- ❑ All the images are recorded on hard disk at high speed (Ram-disk) without the use of the RAM memory (buffer)
- ❑ Disc access time in write or read mode is maximum at 30 ms at 1024x1024 16 bit.
- ❑ OEM user interface software
- ❑ Full DICOM 3.0 integrated

**Features**

**USER INTERFACE**

<b>Keyboard:</b>	Alphanumeric keyboard with special functions. LED lights for functions selected. Flat and waterproof surface ideal for disinfection offers small dimensions.
<b>Video outputs:</b>	<ul style="list-style-type: none"> <li>• 3 video outputs for fluoroscopy, radiography and room monitors at high resolution 1280x1024 with aspect ratio 4:3.</li> <li>• 1 video output at low resolution for VCR or Video Printer.</li> <li>• 1 video output for standard laser print.</li> </ul>
<b>DICOM:</b>	<ul style="list-style-type: none"> <li>• Ethernet output to connect the NDR+ to the hospital net in order to send the images stored to a DICOM printer, to a PACS or to a work station.</li> <li>• USB/2 output to connect a remote CD/DVD recorder to store the images in a DICOM format.</li> <li>• MPPS and Storage Commitment features available.</li> </ul>

**APPLICATIONS**

<b>Fluoroscopy:</b>	<ul style="list-style-type: none"> <li>• Acquisition matrix 1024x1024 at 25f/s.</li> <li>• HCF at 12 or 25 f/s.</li> <li>• Automatic storage on Ram-disk.</li> <li>• 5 levels of integration for the noise reduction of the image.</li> <li>• Automatic regulation of the video level and of the radiologist parameters (kV/mA).</li> <li>• 10 levels of kV/mA selected by the operator to correct the exposure parameters.</li> <li>• 6 different ROI selected before or during the exposure.</li> <li>• 7 levels of edge enhancer.</li> <li>• Positive and negative reverse.</li> <li>• DRF (Dynamic Recursive Filter) which allows pixel by pixel shifting of the recursive filter. Zero persistence.</li> <li>• Road mapping</li> </ul>
<b>Radiography:</b>	<ul style="list-style-type: none"> <li>• Acquisition matrix 1024x1024 at 25f/s.</li> <li>• Automatic storage in real time on Ram-disk for radiography and angio images.</li> <li>• Different acquisition mode with different algorithms in function of exam type.</li> <li>• Anatomic programs personalised for each acquisition mode.</li> <li>• Low dose acquisition.</li> <li>• Manual acquisition rate adjustment.</li> <li>• Manual acquisition rate adjustment before and after subtraction mask acquisition.</li> <li>• LIH last image hold.</li> </ul>
<b>Angiography:</b>	<p>In this modality all the functions of radiography mode are offered along with the following features:</p> <ul style="list-style-type: none"> <li>• Maxop.</li> <li>• DSA (Digital subtraction angiography).</li> <li>• Landmark</li> </ul>
<b>Post Processing:</b>	<ul style="list-style-type: none"> <li>• Symmetrical and asymmetrical electronic diaphragm.</li> <li>• 7 levels manual edge enhancement.</li> <li>• Positive and negative reverse.</li> <li>• Angles and length measurements. Stenosis</li> <li>• Writing possibilities on image.</li> <li>• Exam playback in acquisition speed or frame by frame.</li> <li>• Playback in subtraction with maxop.</li> <li>• Playback in subtraction mode of a standard exam.</li> <li>• Remasking.</li> <li>• Mask pixel shift.</li> <li>• Full size or multi mode print.</li> <li>• Thumbnail mode visualization x16.</li> <li>• Automatic and manual windowing.</li> <li>• Zoom x4 with scroll.</li> </ul>

**Features**

**ELECTRICAL AND MECHANICAL FEATURES**

<b>Power supply:</b>	230 Vac – 780mA - 180W
<b>Weight and dimensions of the rack:</b>	15Kg, 254x345x440 mm
<b>Weight and dimensions of the keyboard:</b>	2 Kg, 40x195x435 mm


**OPERATING CONDITIONS**

<b>Working temperature range:</b>	Temperature: -10° to +45°C Humidity: Operating to 95% relative humidity (non-condensing) Altitude: 15.000ft (4.500mt)
<b>Store temperature range:</b>	Temperature: -35° to +65°C Humidity: Operating to 95% relative humidity (non-condensing) Altitude: 50.000ft (15.000mt)



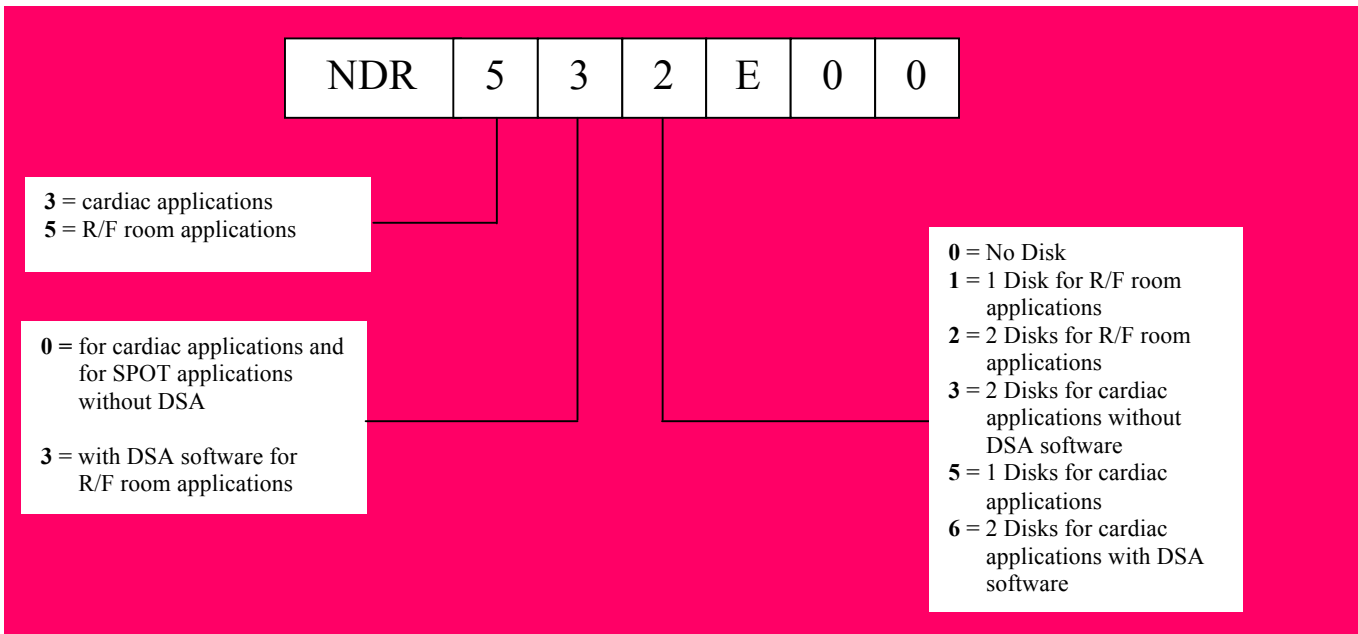
**APPROVALS**

<b>EN 60601-1</b>	Safety
<b>EN 60601-1-2</b>	EMC
<b>EN 60950</b>	Safety information
<b>CE</b>	CE-label according 93/42 CEE directive for medical devices.

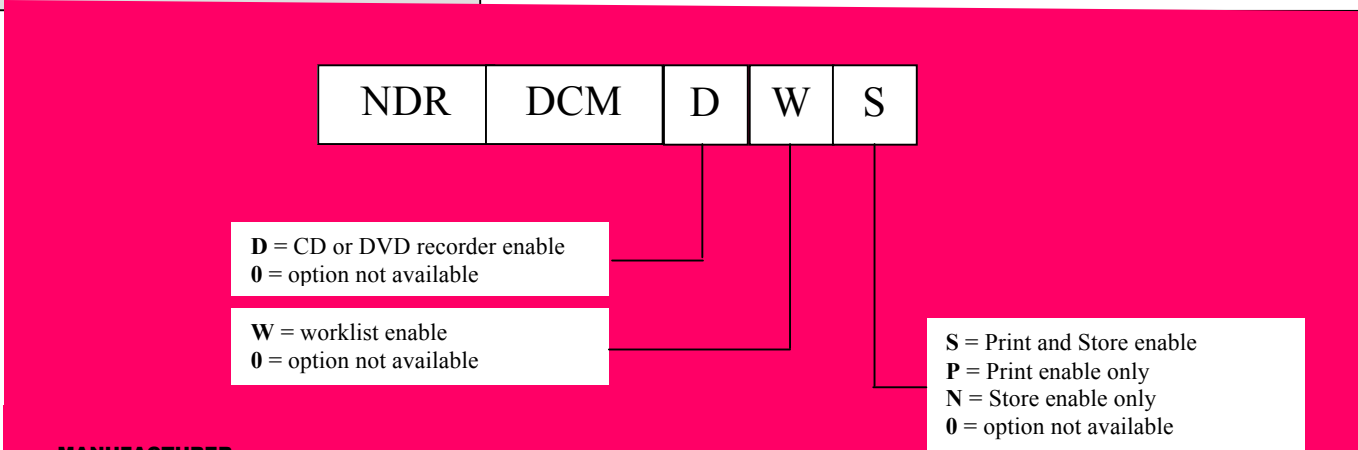
	NDR+ products are cleared for marketing by the US Food and Drug Administration (FDA).
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**Note:** We reserve the right to make any modifications.

**How to order**



**DICOM INTERFACE**



**MANUFACTURER:**

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