# D 4000

D 4000 is a complete digital system for acquisition and processing of digital images obtained from radiography and fluoroscopy studies

## Main applications

- Standard dynamic procedures:
  - G.I. studies
  - Uro-genital
  - Artherio-phlebography
- Angiographic procedures:
  - Cerebral
  - Pulmonary
  - Lower-upper extremity
  - Coronary
  - Kidney
  - Liver

## Main features

- 12” and 16” Image intensifiers
- 1024x1024 CCD digital camera
- 12 bit - 4096 gray levels contrast resolution
- Dynamic acquisition up to 30 frames/sec
- Large series of image dedicated processing features
- Optional angiographic module

| ***Technical data*** | |
|---|---|
| Image intensifier | 12“ , 3 fields |
| | 16“ , 4 fields |
| Optical system | The compact type optical system is specifically designed to transfer the output image from image intensifier to CCD camera.<br>It is complete of remote controlled iris diaphragm and photodiode optical sensor for dose control. |
| TV system | The TV camera uses a large area CCD sensor: 13.1x13.1 mm.<br>Resolution:1024x1024x12 bit (4096 grey levels)<br>Dynamic range: > 66db<br>Progressive scan rate up to 30 frames /s. in pulsed fluoroscopy and from single up to 15 frames/s in fluorography |
| | CCD sensor offer significant advantages compared to conventional pick-up tube:<br>- resolution limited only by pixel number and not further degraded by the electron optics;<br>- uniform resolution over the entire image without the typical reduction at the border;<br>- low readout noise that allow the same signal-to-noise ratio is achieved with a lower signal, i.e. at a lower dose. |
| 18“ LCD Monitor | 1280x1024 pixel |
| PC Hardware | The system is set up by a main controller Motorola 68332, a real time image processor and a host computer with CPU Intel.<br>The computer is complete of 512 MB RAM memory for image acquisition and 36 GB hard disc for images storing.<br>The operative system is Windows® NT 4.0 assuring easy and friendly user interface. |

| ***Acquisition modes and real time processing*** | |
|---|---|
| **Continuous fluoroscopy** | - matrix 1024x1024,<br>- visualization at 30 frames/s,<br>- image saving on hard by means a proper command,<br>- last image hold,<br>- noise reduction with motion sensitivity,<br>- automatic windowing,<br>- multistep edge enhancement,<br>- horizontal and vertical digital image reversal. |
| **Pulsed digital fluoroscopy** | - matrix 1024x1024,<br>- acquisition rate up to 30 frames/s,<br>- automatic image saving on hard disc,<br>- last image hold,<br>- automatic windowing,<br>- multistep edge enhancement,<br>- horizontal and vertical digital image reversal. |
| **Digital Radiography** | - matrix 1024x1024,<br>- acquisition rates single frame and from 0.5 up to 15 frames/s,<br>- tomography,<br>- direct image saving on hard disc,<br>- automatic windowing, |

| | |
|---|---|
| | - multistep edge enhancement,<br>- horizontal and vertical digital image reversal. |
| ***Processing*** | |
| | Contrast, brightness, gamma control<br>Spatial filters<br>Enlargements<br>Overlay and measurements<br>Electronic diaphragms<br>Overview<br>Harmonization |
| Image display | 18“ LCD High resolution monochromatic monitors with high brightness , contrast and resolution<br>For main or reference application in the diagnostic room 1 or 2 additional monitors are possible on request |
| ***Post processing*** | |
| | - Equalization histogram in the interest area;<br>- High speed spatial filters (Smooth, Sharp) with variable Kernel size (from 3x3 to<br>11x11);<br>- Overview of the interest images: 4, 9, 16, 1+5, 1+7;<br>- Grey scale inversion;<br>- Window, level and gamma correction;<br>- Multistep edge enhancement<br>- Rectangular and circular automatic electronic collimators;<br>- Zoom with magnification factor from 1.2 to 3;<br>- Magnification lens, magnification factor from 1.25 to 3;<br>- Horizontal and vertical image shift;<br>- Left/right and up/down image flip;<br>- Cine loop;<br>- Framesage overlay of pre-programmed or user |
| Memory | RAM 512 MB |
| Hard Disk: | 36 GB images |
| ***System Options*** | |
| | Additional Monitor 18“<br>Harddisc 72 GB<br>Kit Angiography<br>Infrared remote control<br>Software for „Image Stitching“<br>DICOM Basis Interface- Image storage<br>DICOM Print<br>DICOM worklist<br>DICOM CD ROM drive<br>DICOM package: Storage, Print, Worklist<br>Laser printer Digital Interface<br>Scan down Konverter SVGA/PAL<br>Additional console |
| ***External connections*** | RS 422 Laser printer Digital Interface |
| | Ethernet TCP/IP Network connectivity with DICOM 3 protocol |