PHYSICS
CHEMISTRY
BIOLOGY
ENGINEERING

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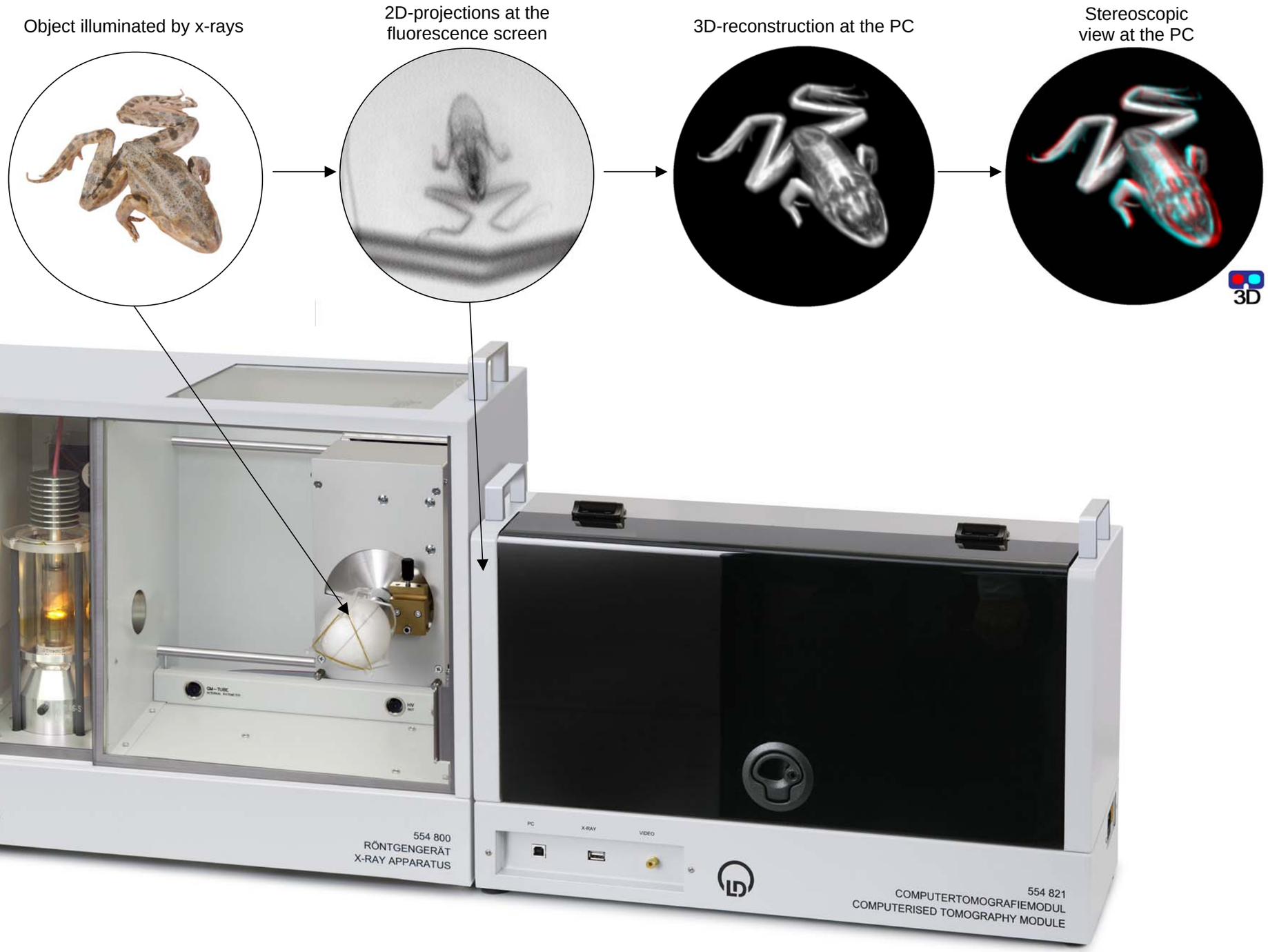
554 821
Computed Tomography

- **e-learning software**
- **compact setup**
- **easy scanning**
- **high resolution**
- **3D-presentation**



In 1963 and 1964 Allan Cormack published the theoretical foundations of computer tomography in the Journal of Applied Physics. In 1972 the first computed tomographic scanner was built by Godfrey Hounsfield who, together with Allan Cormack, was awarded the Nobel Prize in Physiology or Medicine in 1979. The basic idea of computed tomography is the illumination of an object by x-rays from numerous different angles.

Our educational x-ray apparatus allows the illumination of objects by x-rays. The resulting 2D-projections are visualised at the fluorescence screen. These projections have a relatively low intensity. Therefore a camera of high sensitivity has to be used to record the various projections. Such a camera is implemented in the computed tomography module.

By turning an object using the built-in goniometer of the x-ray apparatus, and recording the 2D-projections from each angular step, the computer can reconstruct the object illuminated by x-rays. Our e-learning software visualises the back projection (necessary for reconstructing the computed tomography) concurrently with the scanning process. The 3D-model is then displayed on the PC screen.

554 821
Computed tomography module

Records the 2D-projections of an object illuminated by x-rays within a few minutes. During the recording of the 2D-projections, the e-learning software visualises the backprojection process in two or three dimensions alternately. After the scan the complete 3D-object is available to be viewed (rotating, zooming, transparency effects, projections, illumination similar to the Heidelberger ray-tracing model).
Well-resolved images of various objects can be obtained in spite of the simple measuring method and the low energy of the x-ray radiation (35 keV) from the educational x-ray apparatus. The 3D-computed tomography of various objects can be evaluated qualitatively and quantitatively. The learning involved in the preparation of the scanning process and image evaluation is emphasised.
Additionally, a suitable x-ray apparatus and a powerful computer are required.

Technical Specifications

- Mounting of the object: at the goniometer of the x-ray apparatus
- Maximum object size: approx. 8 x 8 x 8 cm³
- Object resolution: approx. 0.25 mm
- Angular resolution: 1 - 360 2D-projections per computed tomography
- Size of the computed tomography: 200 - 340 pixel per dimension
- Connection of the module to the computer: USB 2.0 port
- Connection of the x-ray apparatus to the module: USB 2.0 port
- Separate Video output: Cinch (CCIR)
- Mains voltage: 230 V, 50 / 60 Hz
- Dimensions: 53 cm x 34 cm x 24.5 cm
- Weight: 13.5 kg

Scope of delivery:
Computed tomography module
Computed tomography software
Object (small dried animal, e.g. frog)
Cell (e.g. for water)
Object holder including polystyrene holder
USB cable

PC Requirements

The real-time recording and evaluation of a computed tomogram need a powerful CPU and graphics card.

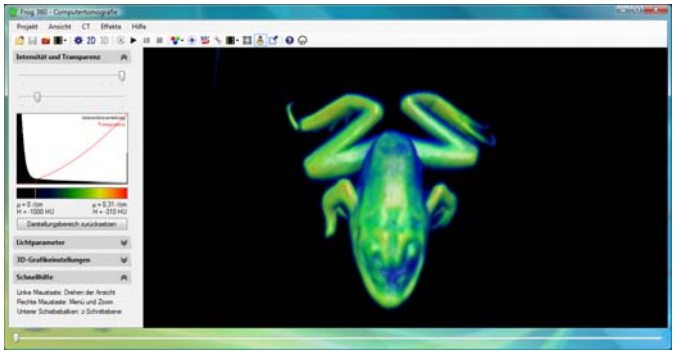
- Windows XP SP2 or Windows Vista (32 bit or 64 bit)
- Dual-Core CPU 2 GHz
- 2 GB RAM
- DirectX 9 compatible 3D-graphics card with shader model 3 support and 256 MB RAM (Nvidia GeForce 7600 / 8600 or better)
- Screen resolution 1024x768 (TrueColor)
- USB 2.0 port

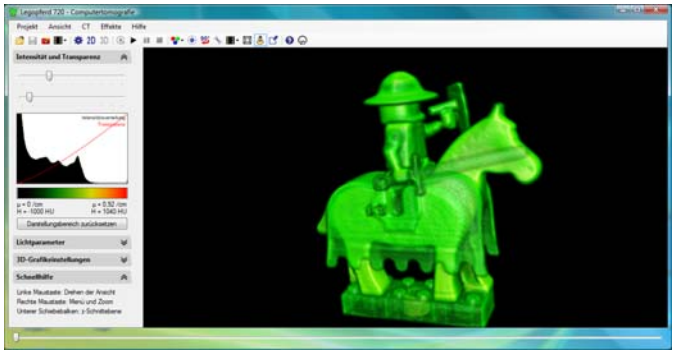
For larger computed tomograms we recommend a more powerful PC
For more information and demo videos: please visit

http://www.ld-didactic.com/phk/ct.asp?L=2

554 825 LEGO Adapter

The Lego adapter serves for the mounting of small Lego parts at the goniometer (554 831) of the x-ray apparatus (554 801) for the recording of computed tomography with the Computed tomography module (554 821).





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