# GammaKey

## Data acquisition, storing and analysis for gamma camera



### GammaKey acquisition types

Static acquisition (zoom: 1x, 2x)

Dynamic acquisition (zoom: 1x, 2x)

Whole body acquisition

Dual isotope acquisition (static and dynamic)
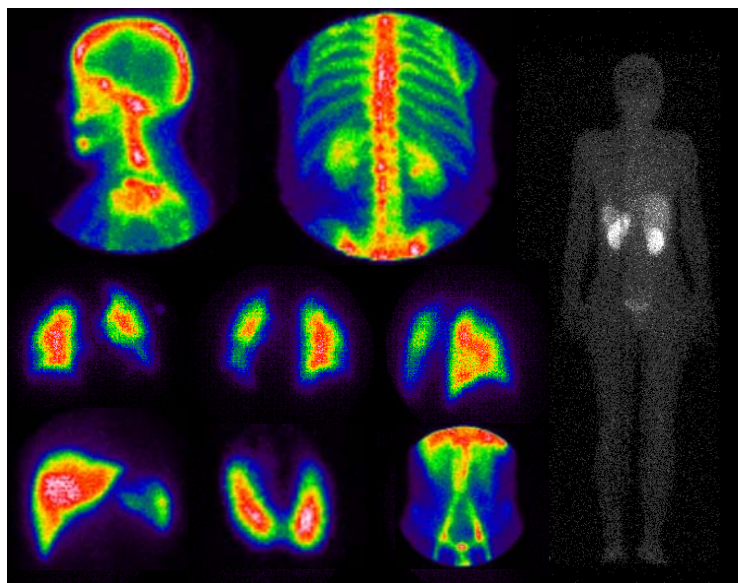
Frame format: 32x32, 64x64, 128x128, 256x256

Real time visualization

### Technical data

Count rate (max): 200 kHz

A/D conversion per channel: 2 µs

Total A/D conversion time: 4 µs



### GammaKey database

Microsoft Access 2003 database password protected

Predefined studies (saving time by storing of all technical parameters of typical used studies)

Administrative data of patient stored (patient ID, patient name & surname, birthday, sex)

Technical data of each study stored (collimator, number of isotopes, names of isotopes, dose, organ, end condition (manual, by counts, by time), image format, number of images (available only for static images, max=12 images), number of groups of images (available only for dynamic studies, max=5 groups))

Administrative data of each study stored (study ID, date & time of study, type of study, description, doctor)

Study reports stored (storing templates for reports available too)

Search the database by following criteria: 1) date – today, whole archive or time interval

2) patient data – patient ID, patient name or surname, doctor's name

3) study – study ID, type of study

Easy adding the new study for the patient that exists in the database (saving time)

Synchronizing of all data between acquisition and processing workstation.
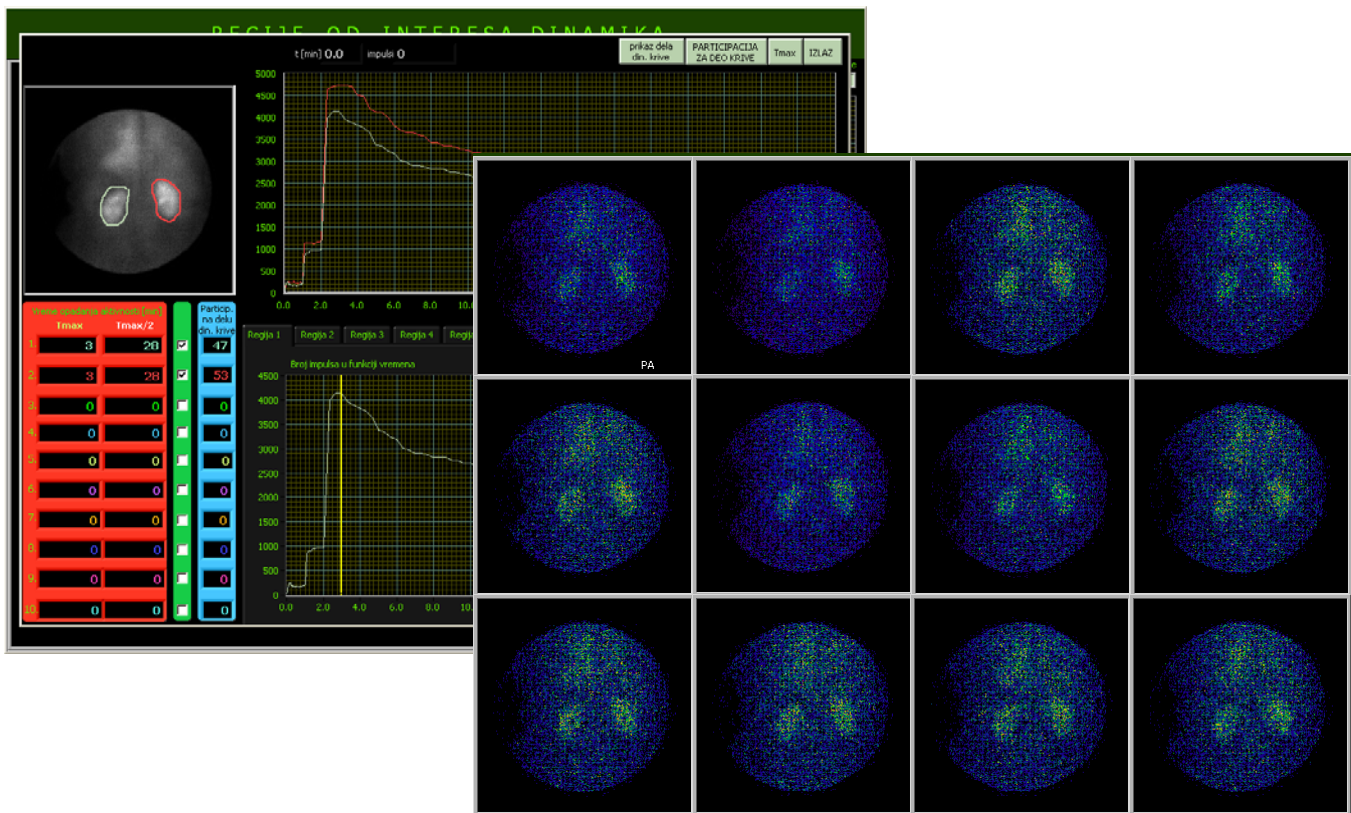
**GammaKey data analysis**

Flood correction (acquisition of test detector image and correction study images to test detector)

Slice analysis of test detector (vertical and horizontal slice display)

Basic image offline manipulation (zooming, low & high threshold adjustment, smoothing)

Correction the image by "removing" the selected part of image and rescaling the counts to the new maximum

Adjustment of number of images on display: 1, 4, 9 or 12

Basic pallets available (black & white, rainbow, region, stars, heart, edges, thalium)

Saving images in ASCII, bitmap or jpeg format available

Display dynamic study as a movie with speed adjustment available

**Static study specific analysis**: manual or automatic detection of ROIs, ROIs activities calculation, "six regular regions" analysis, background correction, AP/PA correction

**Dynamic study specific analysis**: selection of number of images that will be "summed" , manual detection of ROIs, displaying dynamic curves, arithmetic operations on dynamic curves, smoothing of dynamic curves, calculation of Tmax/2 and participation

**Dual isotope specific analysis**: ADD/SUB of images

Special routine for analyzing the kinetics of In111 labeled platelets available: calculating of survival curve, production index and sequestration index of labeled platelets.

**Components of GammaKey acquisition system**
- Windows based computer
- Certified A/D board from National Instruments
- Adapter with BNC connections for X(positional), Y(positional), Z(logical) signals
- Monitor and B&W printer (color printer available too)
- Gamma Key software with database in Microsoft Access 2003

**Systems available**
Level 1: One Win OS based platform with the data acquisition system and BNC adapter, printer, GammaKey software with database in Microsoft Access 2003
Level 2: Two Win OS based platforms (one for acquisition/image analysis, one for data analysis connected with the acquisition system), printer, GammaKey software with database in Microsoft Access 2003

**Conditions**
Delivery:  30 days
Warranty: 1 year for parts and work
Service:   48 hours during the warranty period
Support:   2 years after the delivery for parts and software
Extended service: Development of new routines for special requirements in diagnostics and data manipulation

**Notes**
*Reference: Clinical Center of Vojvodina, Novi Sad, Serbia*
*Clinical Center of Serbia, Belgrade, Serbia*

*List of publications:*

- M. Petrovic, V. Artiko, V. Obradovic, V. Bosnjakovic, and D. B. Popovic, High quality PC-based nuclear medicine Image Acquisition System, *IEE Colloq Dig,* vol. 4-10408, pp. 77-80, 2004.

- M. Piperski, B. Pijetlović, D. Popović, Virtual instrument for archiving and processing gamma studies, *Proc of the 10th Information technologies IT'2005*, pp. 67-70, Žabljak, 27 Mar-1 Apr, 2005.

- M. Piperski, D. Popović, Automatic detection of regions of interest on gamma studies, *Proc of the 50th ETRAN Conference*, Sveska 3, pp. 241-244, Beograd, 6-8 June, 2006.

- M. Janković, Development of application for investigation the kinetics of indium-111 labeled platelets, *Proc of the 53rd ETRAN Conference*, Vrnjačka Banja, 15-18 June, 2009, CD.

- M. Jankovic, B. Pijelovic, D. Popovic, M. Petrovic, N. Jorgovanovic, J. Jakic, and J. Jovic, Using Labview to develop the GammaKey system for acquiring, storing, retrieving and processing gamma studies, NI Case study, http://sine.ni.com/cs/app/doc/p/id/cs-13511

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