

Software

«SpectEx»

Compatibility:

AT1321
AT6102, A, B

* Software function package depends on instrument type

Purpose:

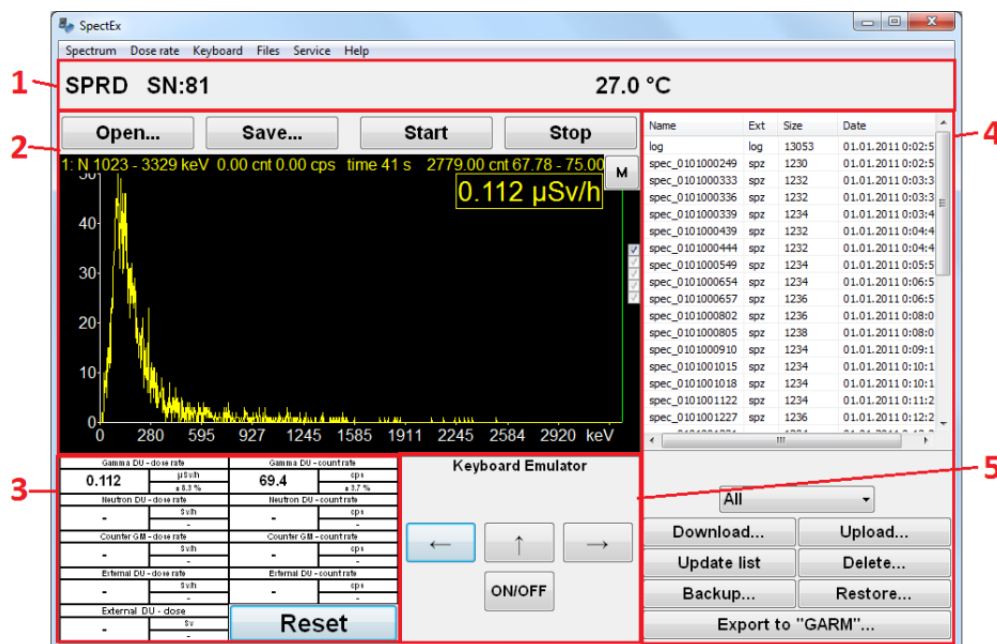
SpectEx can synchronize with AT1321 & AT6102 spectrometers, analyse and display gamma radiation spectrum data.

User-friendly and easy-to-use interface fits a wide range of users even with minimal experience.

Powerful features in combination with high accessibility make SpectEx an ideal software solution.

OPERATION

SpectEx transmits data from instrument to PC with subsequent data analysis: Acquired spectrum is displayed and radionuclides are automatically identified according to currently selected radionuclide library. Real time data display function is realised.



Device information

Displays name, serial number and device status.

Spectrum

Acquired spectrum is displayed and radionuclides are automatically identified according to currently selected radionuclide library.

Readout

Measured values are displayed, particularly when external detecting units are connected to instrument.

| Gamma DU - dose rate | | Gamma DU - count rate | |
|-------------------------|----------------------------------|--------------------------|-------------------------------|
| 0.514 | $\mu\text{Sv/h}$ $\pm 1.2\%$ | 456 | cps $\pm 0.7\%$ |
| Neutron DU - dose rate | | Neutron DU - count rate | |
| 0 | $\mu\text{Sv/h}$ $\pm 0.0\%$ | 0.005 | cps $\pm 200.0\%$ |
| Counter GM - dose rate | | Counter GM - count rate | |
| 0.325 | $\mu\text{Sv/h}$ $\pm 33.3\%$ | 0.127 | cps $\pm 33.3\%$ |
| External DU - dose rate | | External DU - count rate | |
| - | Sv/h | - | cps |
| External DU - dose | | External DU - dose | |
| - | Sv | - | Sv |
| Reset | | | |

User interface

There are five frames:

- 1 – Device information
- 2 – Spectrum
- 3 – Device readout
- 4 – Files
- 5 – Keyboard.

Connecting to device

USB or Bluetooth interface is used for connection to instrument.

Service functions

- Backup and recovery of system files
- Installation of required user radionuclide libraries
- Remote control
- Setting of instrument date and time
- Instrument memory clearing
- Making screen shots of instrument display
- Unit diagnostics

Additional features

- Further data processing by dedicated "GARM" software.



ATOMTEX

INSTRUMENTS AND TECHNOLOGIES FOR NUCLEAR
MEASUREMENTS AND RADIATION MONITORING

WORKING WITH SPECTRUM

1. Setting the spectrum view

Tools are available in right-click menu, opened by a right click in spectrum screen.

The following actions are possible:

- Adjust colours for spectra, scales, markers, Gaussian forms and bases (Colours in right-click menu)
- Select scale display mode in channels or in keV (Scale X in right-click menu)
- Switch count scale to logarithmic mode (Scale Y in right-click menu)
- Hide both scales, select necessary spectrum information to be displayed spectrum screen (View settings in right-click menu).

Spectrum manager...
Remove spectrum...
Spectrum properties...

Nuclide identification ▶

Approximation ▶

Hide markers

Remove markers

Remove peak's markers

Scale X ▶

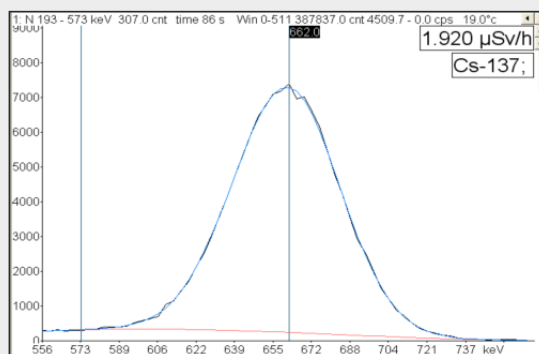
Scale Y ▶

Spectrum view ▶

Colors ▶

View settings ▶

5. Peak processing



Peak
approximation
results

| Param | Value | Error(P=0.95) | Rel. error, % |
|---------------|----------|---------------|---------------|
| Area | 50101.28 | 875.46 | 1.75 |
| Amplitude | 2400.61 | 29.65 | 1.24 |
| Position | 220.03 | 0.24 | 0.11 |
| Sigma1 | 9.02 | 0.24 | 2.72 |
| Sigma2 | 7.63 | 0.17 | 2.27 |
| Average Sigma | 8.33 | 0.11 | 1.36 |
| FWHM | 19.61 | 0.27 | 1.36 |
| Resolution, % | 8.82 | 0.12 | 1.37 |

$\chi^2 = 1.2 (61)$ OK

Peak
characteristics

2. Spectrum analysis

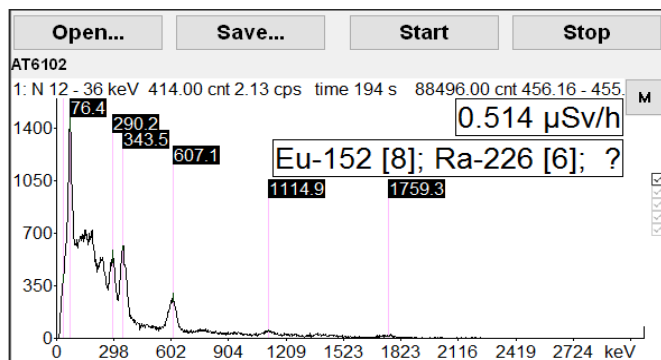
The spectrum is analysed with the help of moving marker, which can be moved by keyboard buttons or mouse cursor. You can select and display necessary part of spectrum, zoom spectrum height and width, drag spectrum in the display window, set and remove vertical and horizontal markers.

3. Spectrum properties

This window can be used to evaluate spectrum acquiring conditions. Some spectrum properties, e.g. name, comment or measurement date, are editable, if this spectrum is not being acquired at the moment.

4. Search peaks in spectrum

Select "Nuclide identification" context menu option to use this command. Thus markers will be displayed in each detected peak position, and names of identified radionuclides will be displayed in spectrum info box in upper right-hand corner.



Automatic identification is enabled by default.

6. Operations with spectrum

▪ Deduct spectrum from spectrum

▪ Add two spectra

▪ Smoothing

The feature can be used to smooth spectrum by method of constantly moving smoothing area, which width depends on resolution and specified parameter.

▪ Nonlinear compression

The feature can be used to convert spectrum to ensure approximately equal values of sigmas in each channel. Thus, all peaks in the spectrum will be about the same width. Where spectrum will be compressed or stretched in these channels depending on the specified argument.

▪ Spectrum convolution with second order derivative of Gaussian function

The feature forms spectrum convolution with second order derivative of Gaussian function. Where the resulting spectrum may contain the following: Full energy peaks, other peaks of Gaussian shape and Compton edges. This function is a basis for radionuclide identification.

▪ Radionuclide identification threshold

The feature forms spectrum convolution with second order derivative of Gaussian function and calculates convolution dispersion. Then root of convolution dispersion is multiplied by the specified argument. This function is a basis for radionuclide identification. The resulting value is the peak limiting threshold.

▪ Linear compression

The feature converts spectrum into specified number of channels either with calibrations conversion, or without.

▪ Assigning spectrum processing tasks

All above features can be automatically performed by Software in the process of measurement.



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