



**Scientific and Production Unitary Enterprise**

# **“Radiation Scanner Assistant”**

**Software User’s Manual**



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**Important!** Screenshots in this Software User's Manual can differ from actual “Radiation Scanner Assistant” user interface screens in user’s rugged handheld computer.

**Important!** Specifications of rugged handheld computer listed in this Software User's Manual can differ from specifications of supplied device.

## **1 Contents and intended purpose of “Radiation Scanner Assistant”**

**“Radiation Scanner Assistant”** is an Android application and can be used on rugged handheld Android based computers (hereinafter the PDA) supplied with AT6101C, AT6101CM and AT6101CE spectrometers (hereinafter the BRD) and other spectrometers for the following purposes:

- Spectral radiation monitoring of indoor and outdoor areas with geo-referencing,
- Detection and identification of gamma radionuclides, measurement of ambient gamma radiation dose equivalent rate,
- Detection of neutron radiation sources.

**“Radiation Scanner Assistant”** requires Android operating system version 4.2 or later.

**“Radiation Scanner Assistant”** offers the following functions:

1. Connecting to gamma and neutron channels.
2. Automatic setting of gamma and neutron channels parameters.
3. Preparing gamma and neutron channels for operation
4. Stabilizing of gamma channel.
5. Measurement and display of gamma radiation energy distribution.
6. Measurement and display of ambient gamma radiation dose equivalent rate.
7. Measurement of gamma radiation count rate.
8. Indication of ambient neutron radiation dose equivalent rate.
9. Measurement of detectable neutron radiation count rate.
10. Identification of radionuclides.
11. Voice notifications about all modes of program operation and radiation environment to operator
12. Logging of events and scan results.
13. Snap measurement to location using a GPS receiver and display measurement results.
14. Saving measurement files to cloud storage.

The delivery package includes:

- External storage medium containing the software installation package and electronic copy of the Software User’s Manual
- Printed copy of the Software User’s Manual.

Basic user skills and knowledge about Android OS are required to operate this program. This Software User's Manual does not describe standard principles of launching

and closing programs, as well as how to use menus and tool bars for sending commands, and perform other actions.

## 1.1 How to install the “Radiation Scanner Assistant”

1. Turn on the PDA.
2. Copy the “**Radiation Scanner Assistant.apk**” file to PDA memory.
3. Run the “**Radiation Scanner Assistant.apk**” file on PDA and wait until the program installation is complete.


Before installing a new version of the program, uninstall the previous version of it. Follow by running the “**Radiation Scanner Assistant.apk**” file on PDA with a new version of the program.

## 1.2 How to start/close the program

To start the program, tap the “**Radiation Scanner Assistant**” icon (see the Figure 1).



Figure 1

Open the main menu of the program by swiping the finger from the left edge of the PDA screen to the right or by tapping the “” menu button.

Minimizing the window does not close the program and it continues to run in the background.

To close the program, select “**Menu→Exit**”.

## 1.3 How to uninstall the “Radiation Scanner Assistant”

To uninstall the “**Radiation Scanner Assistant**” program, use standard uninstall procedures of your Android OS.

The PDA stores measurement files, event logs, GPS coordinates, saved settings of uninstalled program in a dedicated folder in its internal memory.

## 1.4 How to connect the components

To start operation, connect all components using respective cables from delivery set and adjust connections between BRD components.

**“Radiation Scanner Assistant”** uses gamma and neutron channels by connecting to existing BT-DU3 adapter and automatically detects the types of detection units (hereinafter the DU).

BT-DU3 adapter connects to PDA by Bluetooth wireless link.

#### **1.4.1 Pairing of Bluetooth headphones**

1. Activate pairing mode on the headphones as described in the headphones manual.
2. Open **“Bluetooth”** settings window and turn **Bluetooth** on.
3. Search for devices.
4. Select headset from the list of devices.
5. After pairing the headset connects automatically (you hear a short melody in the headset when the connection has been established).

#### **1.4.2 Pairing of smart glasses**

Smart glasses use Bluetooth wireless interface to connect to PDA (see section 4 in the Software User’s Manual for the **“RadGlasses”** program).

#### **1.4.3 Establishing connection to BT-DU3 adapter**

1. Connect the DU to BT-DU3 adapter using DU cables from the delivery set.
2. Start the BT-DU3 adapter by pressing and holding the **“Power”** button until the LEDs are on.

**Important!** The BT-DU3 adapter powers off automatically in 10 minutes, if no connection has been established to it.

3. Start the **“Radiation Scanner Assistant”** program.
4. Turn on the Bluetooth on PDA and pair the BT-DU3 adapter.
5. Automatic search for devices starts the first time you run the program. Tap the **“Search devices”** button for searching devices, and tap the **“Stop device search”** button for stopping the search.
6. Select BT-DU3 in the list of devices.
7. To change the BT-DU3 adapter, select **“Menu — Find spectrometer”**. A list of devices available for connection will be displayed. Select the BT-DU3 included into the BRD delivery set from the list of devices, which will be used for further operation.

### **1.5 Running time and battery charging**

While in stand-alone mode the PDA runs on built-in battery and BT-DU3 adapter supplies power to gamma and neutron channels, which are charged by AC adapters. Minimum continuous operation time of PDA (with a 3400 mA/h battery) is 10-12 hours in

stand-alone mode with fully charged batteries. This parameter varies depending on PDA specifications.

Minimum continuous operation time of BT-DU3 adapter is 20 hours in autonomous mode with fully charged battery and depends on the number of measurement channels connected.

The program keeps track of free PDA memory and if available memory is not enough for 19 minutes (0.3 hours) of scanning, the program displays notification and terminates after closing the notification window.

When BT-DU3 adapter battery charge is below 8 %, the program displays a low battery notification for gamma channel and switches the BRD to “**Idle**” mode after closing the notification window.

When PDA battery charge is below 5 %, the program displays low PDA battery notification and after a while switches the BRD to “**Idle**” mode.

## 2 Using the program

How to work with “**Radiation Scanner Assistant**”:

1. Start the “**Radiation Scanner Assistant**” program.
2. Connect to BT-DU3 adapter (see 1.4.3)
3. Wait until “**Radiation Scanner Assistant**” connects to gamma and neutron channels.
4. Use the check sample to stabilize the gamma channel, if required (see 2.3).
5. Make sure the calibration is successful.
6. Type a keyword or scanning place name or comment. It will be added to the name of the result folder. By default, the result folder has a unique name, which includes the date and time the scanning started.
7. Wait until the background acquire process is complete.
8. Start radiation scanning, carry the BRD on foot, in car etc.
9. GPS signal appears only if you are in satellite visibility zone (in open ground outdoors).
10. Stop moving when gamma radiation alarm signal sounds and wait until object or source radionuclide content identification process ends.
11. When neutron radiation detection signal is generated, stop and find maximum radiation point according to neutron channel count rate.

Maintaining operability of “**Radiation Scanner Assistant**”:

1. The program periodically generates an audio signal to inform user that it is operating normally.

2. The program provides gamma and neutron channels diagnostics. In case of a failure or error, the program enters the “**Connecting**” mode. In this case power BT-DU3 adapter off and on again. If failure persists, contact manufacturer.
3. If the program finds no gamma channel calibration data, then it will switch to the “**Connecting**” mode. Restart scanning. If failure persists, contact manufacturer.

## 2.1 User interface description

The user interface is represented as control and indication units shown in figure 2.

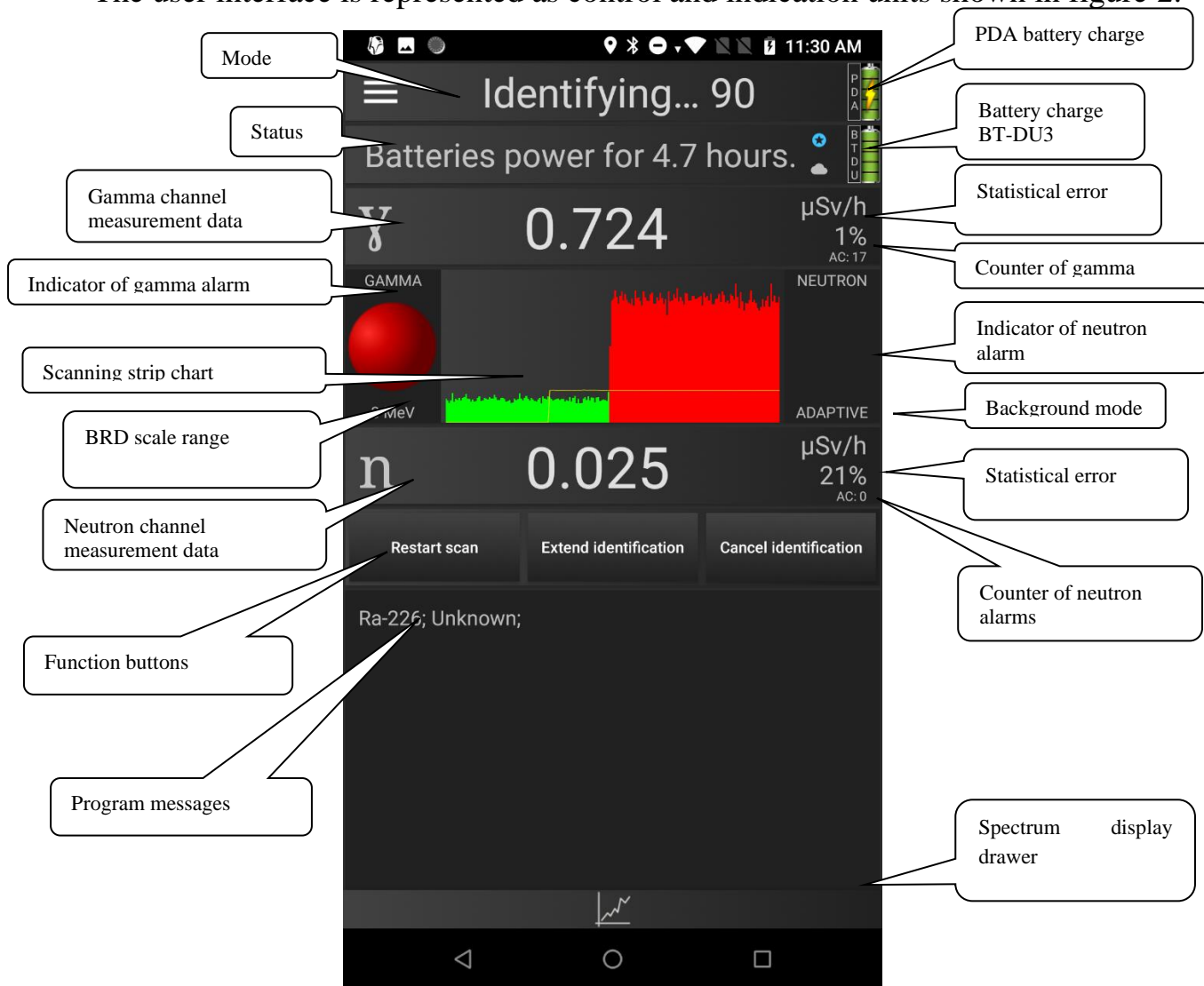


Figure 2 — User interface of the program

**Mode** — current mode of BRD.

**Status** — current status of BRD. Tap this line to display detailed information about BRD status in a new window.



– This icon is displayed when the external settings file tracking is enabled.





– The “cloud” icon is displayed when the file transfer to cloud storage is enabled in the settings. The loading process is visualized in percentage.

**Gamma channel measurement data** — Tap this line to cycle gamma radiation dose rate value ( $\mu\text{Sv/h}$ ), pulse count rate value (cps), and accumulated dose ( $\mu\text{Sv}$ ). If the high dose rate DU is enabled, the 5 modes change:

- dose rate ( $\mu\text{Sv/h}$ ), count rate (cps), dose ( $\mu\text{Sv}$ ), wide-range DU dose rate ( $\mu\text{Sv/h}$ ), and wide-range DU count rate (cps).

**Indicator of gamma alarm** — Gamma channel alarm indicator (red).

**Neutron channel measurement data** — Tap this line to cycle neutron radiation dose rate value ( $\mu\text{Sv/h}$ ) and detectable neutron radiation count rate value (cps).

**App messages** — Various messages with a result of radionuclide identification, information of the latest alarm, etc. Tap this line to display event log in a new window.

**Scanning strip chart** — Strip chart of gamma channel count rate values. Green strip indicates there are no alarms. Blue strip indicates there are neutron channel alarms. Red strip indicates there are gamma channel alarms.

**Statistical error** — Statistical error of gamma or neutron radiation dose rate or count rate.

**AC (Alarms counter)** — Number of alarms on the gamma or neutron channel.

**Indicator of neutron alarm** — Neutron channel alarm indicator (blue).

**BT-DU3 battery charge** — Charge level of BT-DU3 adapter battery.

**PDA battery charge** — Charge level of PDA battery.

**Spectrum display drawer** — Expanding / collapsing panel with gamma radiation spectrum.

**Background mode** — The type of background under which the measurement is made.

**Scale range** — Displays the energy scale range of connected DU.

## 2.2 “Connecting” mode

In “Connecting” mode the program connects to gamma channel and neutron channel. See Figure 3 for “Connecting” mode screen.

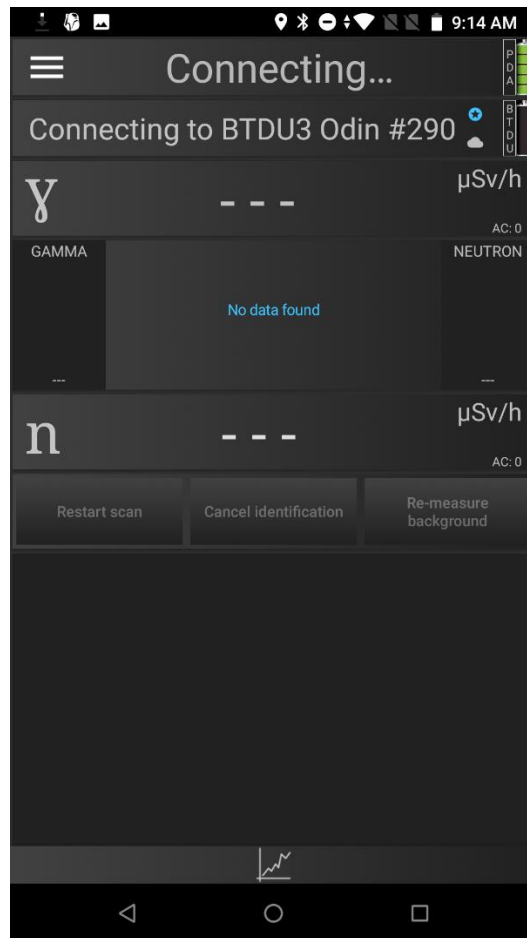
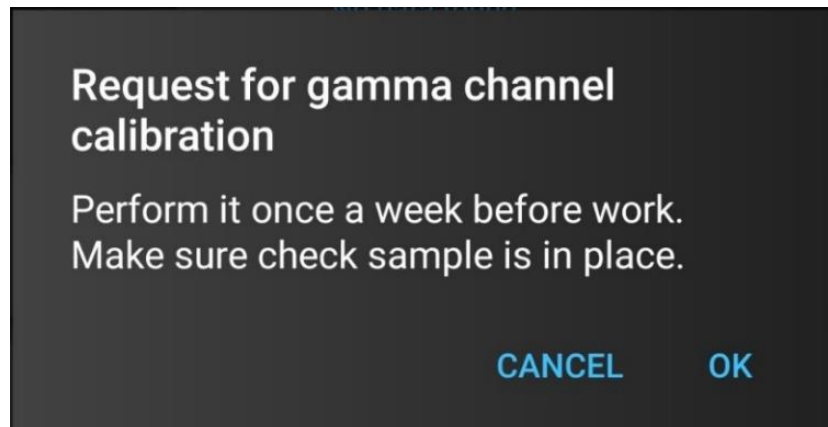


Figure 3 – “Connecting” mode

## 2.3 “Preparing” mode

In “**Preparing**” mode the program prepares channels for operation and warms up the gamma channel.

When the gamma channel is warming up, the program displays an invitation to perform gamma channel calibration (see Figure 4).



**Figure 4 – Invitation to perform gamma channel calibration**

Gamma channel calibration is required for normal operation of measurement system. It is recommended to perform gamma channel calibration once a week before operation. **NO** foreign sources of radiation must be present near the BRD.

During calibration the program acquires spectrum and checks 1461 keV energy peak position from  $^{40}\text{K}$  contained in check sample (potassium fertilizer). After calibration, the program checks peak position.

Before starting calibration, place the check sample at the end of the gamma radiation DU. Tap the “OK” button to start calibration. For calibration progress see Figure 5. When stabilization is complete, the program will output the result: **“Calibrated successfully”** / **“Calibration failed”**.

Tap the **“Cancel”** button to go to scanner mode without performing calibration.

You can force gamma channel calibration using the **“Menu→Calibrate”** command. For more details on calibration see Section 2 in User's Manual on the BRD.

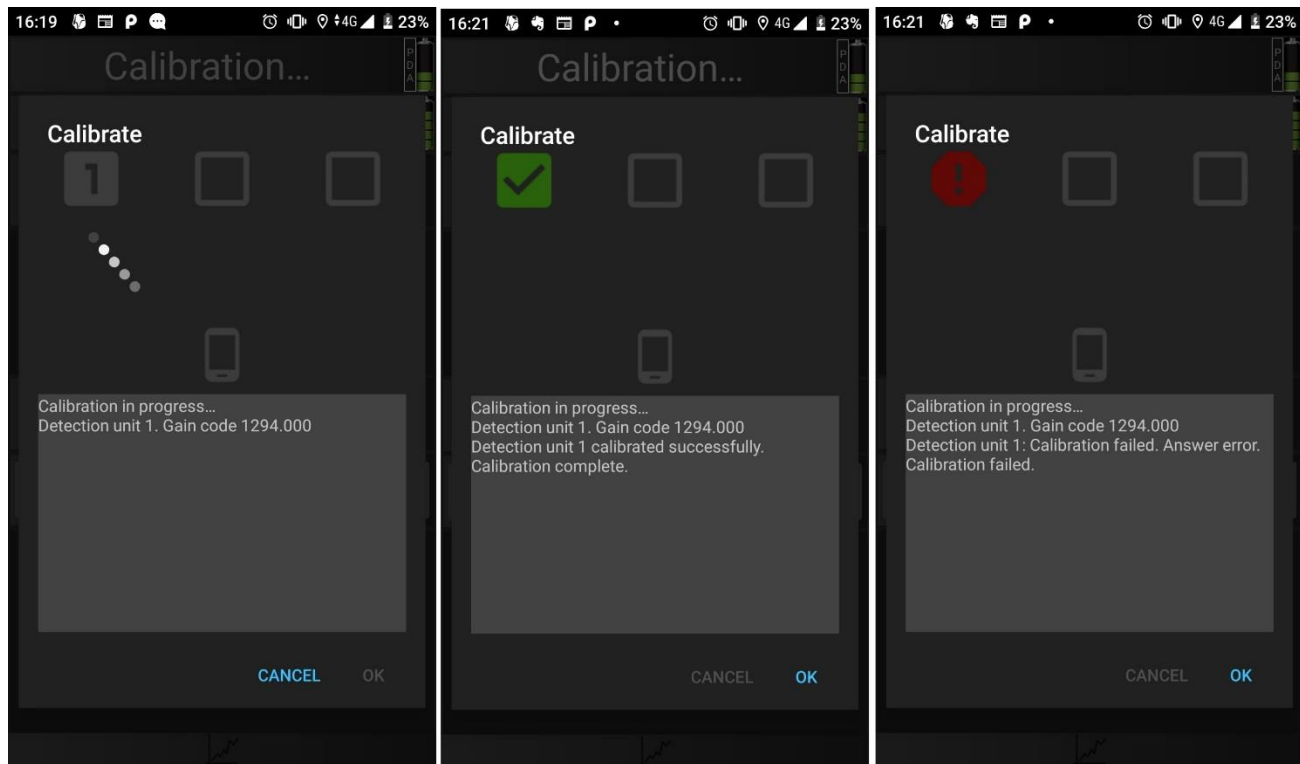
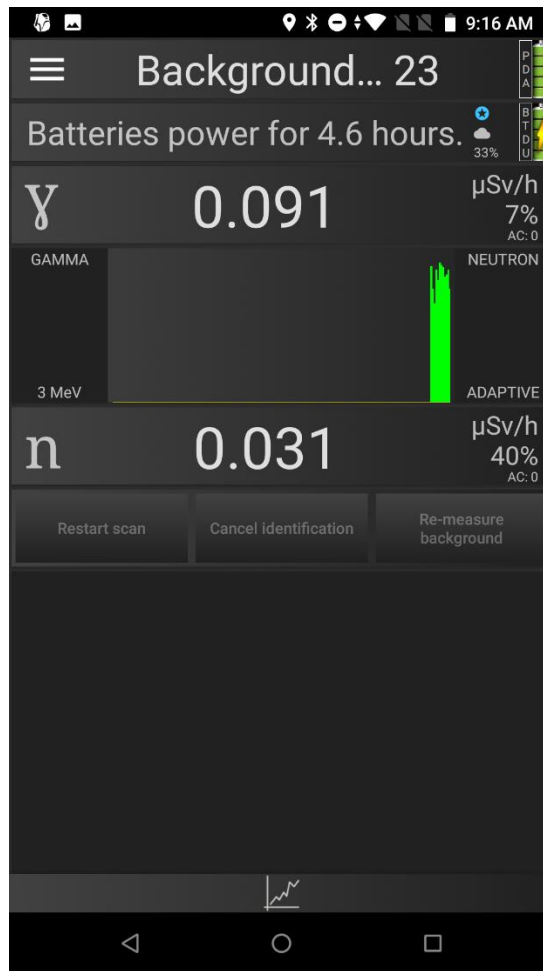


Figure 5 – Calibration progress

## 2.4 Background mode

Background data is necessary for proper implementation of spectrometer search functions for gamma-emitting sources of radiation. The duration time of the “**Background**” mode is 30 seconds; within this time the program measures gamma channel count rate and stores it in memory. See Figure 6 for “**Background**” mode screen.



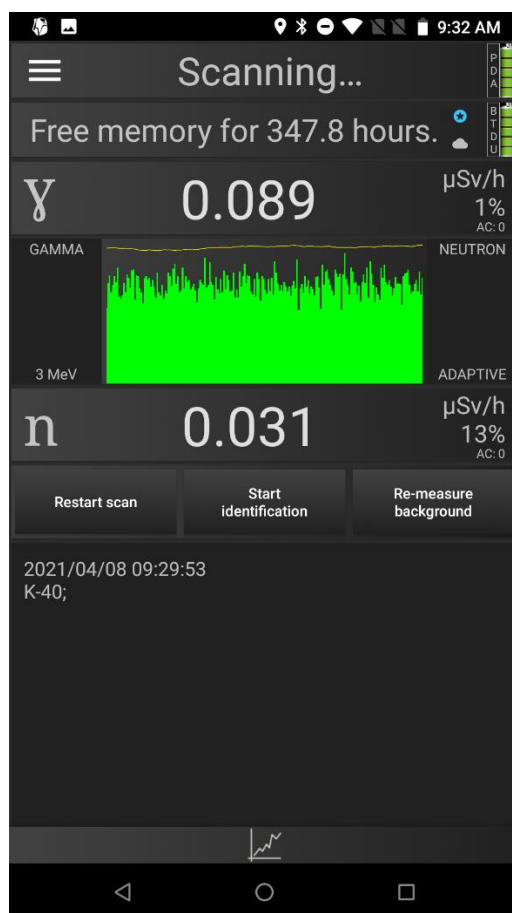
**Figure 6 – “Background” mode**

It is necessary to acquire background at a distance from examination object since this background serves as a reference for analysis of gamma radiation intensity from detected radioactive source.

## **2.5 Scanning mode**

The “**Scanning...**” mode is a process of gamma and neutron radiation sources detection with snap to location and saving all results.

This is the main operation mode. See Figure 7 for “**Scanning...**” mode screen.



**Figure 7 – “Scanning...” mode**

The “**Scanning...**” mode features:

1. Acquire spectrum with specified period (every 5 seconds by default) and save it to a file with unique name in the **results folder**.
2. Measure gamma channel count rate three times per second and save it to the count rate file with unique name in the **results folder**.
3. Measure neutron channel count rate once per second and save it to the count rate file with unique name in the **results folder**.
4. Perform GPS snap to location and saves snap data to spectra files, count rate files, Google Earth waypoint files in the **results folder**.

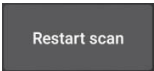
Tap the spectrum display drawer to show/hide spectrum being acquired in Scanner mode.

When you search for a radiation source and hear audio signals, start moving in the direction where these sounds are generated at a higher rate to locate the source of radiation.

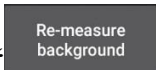
When you search for a radiation source and hear audio signals, start moving in the direction where these sounds are generated at a higher rate to locate the source of radiation.

When a radiation source is detected, the gamma channel triggers the sound, voice and light alarm notification and the program switches BRD into “**Identifying...**” mode automatically.

The program detects neutron radiation using analysis of neutron radiation count rate overrun over preset thresholds. If a single threshold is exceeded, sound, voice and light alarms for the neutron channel are activated.

Restart the scanning by going to “**Menu→Restart scanning**” or by tapping the “” button. Then the program suggests adding a keyword, comment or name of a place where scanning takes place.

In “**Scanning**” mode you can work in various background modes:


1. *Permanent background* — Background acquired once before scanning and is used for comparison during search for gamma radiation. Permanent background re-measurement can be forced by using the “**Menu→Reset and re-measure background**” command or by tapping the “” button in the main window of the program.
2. *Adaptive background* — Background acquired before scanning, however further it constantly changes and adapts to alterations of radiation level. Adaptation runs if there are no gamma channel alarms only. In adaptive background mode the background value is adjusted to current radiation background approximately in 30 seconds.

You can switch to desired background mode by going to “**Menu→Settings→General settings→Background mode**” and select the “**Permanent**” or “**Adaptive**” variant.

## 2.6 Identifying mode

The “**Identifying...**” mode is a continuous spectrum acquisition mode for identification of radionuclide content of an object or source of gamma radiation.

See Figure 8 for “**Identifying...**” mode screen.

You can force the “**Identifying...**” mode by going to “**Menu→Start identification**” menu or by tapping the “” button.

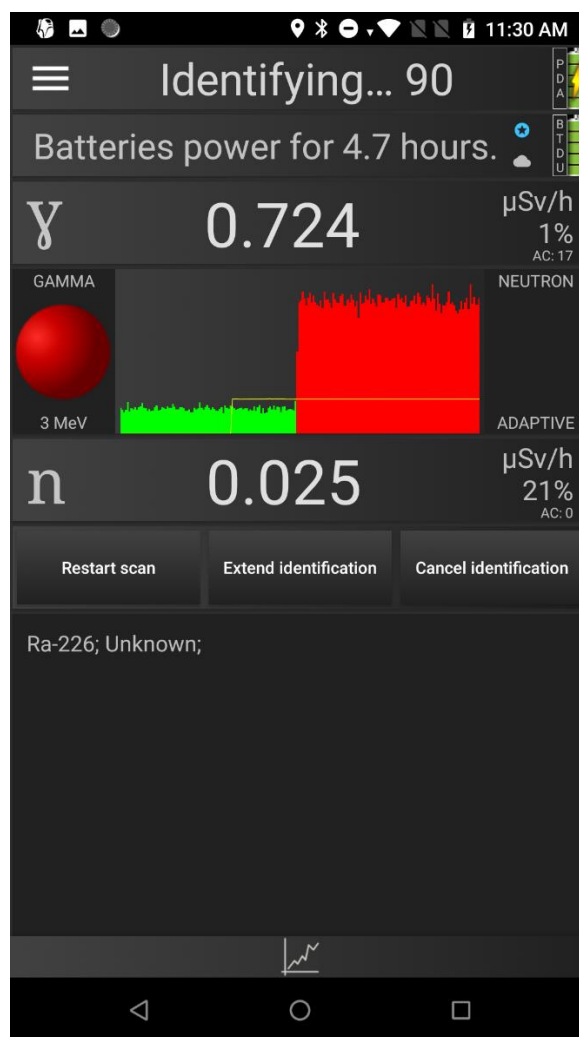


Figure 8 – “Identifying...” mode

In “**Identifying...**” mode the program continuously measures spectrum over a set period of time (default setting is 120 s) and identifies radionuclide composition while spectrum is being measured. Operator can change measurement time of identification spectrum: go to “**Menu→Settings→General settings→Spectrum acquiring time (s) In identification mode**”.

The BRD performs identification of a detected gamma-emitting radionuclide or a mix of gamma-emitting radionuclides provided that radionuclide information is present in BRD library or that the detected mix allows to find all or some radionuclides in the mix and is present in BRD library, taking into account gamma channel energy resolution and contribution of each radionuclide in mix.

Tap the spectrum display drawer to show/hide spectrum being acquired in identification mode.

Each identified radionuclide is displayed on the screen accompanied by corresponding voice message.




If the “**beta**” message is displayed while identification is in progress, the Bremsstrahlung of beta particles is detected.

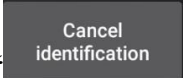
If the program cannot identify a radionuclide reliably (the so-called unrecognized radionuclide), the operator hears the “Identified. Unknown.” voice message.

The program can automatically extend identification time due to the following reasons (however not more than two-fold):

1. Presence of unrecognized radionuclides during identification.
2. Gross gamma count rate alarm.

Extend the identification period manually by go to “**Menu→Extend identification**” or by tapping the “” button.

The program saves each identification result into the “*Identification*” subfolder in the **scan results folder**.

The program exits the identification mode after one spectrum measurement cycle. You can force identification stop by going to “**Menu→Stop identification**” or by tapping the “” button.

Then BRD exits the “**Identifying...**” mode and switches to the “**Waiting**” mode.

## 2.7 Threshold override sub-mode

If the safety threshold is exceeded, the program triggers a voice and sound alert. At the same time the message area displays “**Radiation safety alarm**” message. That is an indication to **IMMEDIATELY** leave the location where the radiation contamination has been detected! (see Figure 9)

## 2.8 Overload sub-mode

When the upper range limit of the connected detection unit is exceeded, the overload mode is triggered. In this case, the program informs user by voice alert and alarm, and the letters “**OL**” will be displayed near the alarm indicator. In case the spectrometric DU is overloaded (when the wide-range DU is connected) the readings will automatically switch from spectrometric to wide-range, and the message “**Dose rate overload**” will appear in the mode display line and message area of the program. In case the spectrometric DU is overloaded (when the wide-range DU is not connected) or if the wide-range DU is overloaded, the message “**Gamma channel overload**” is displayed in the mode display line and the message area of the program.

Any overload will result in disabled identification.

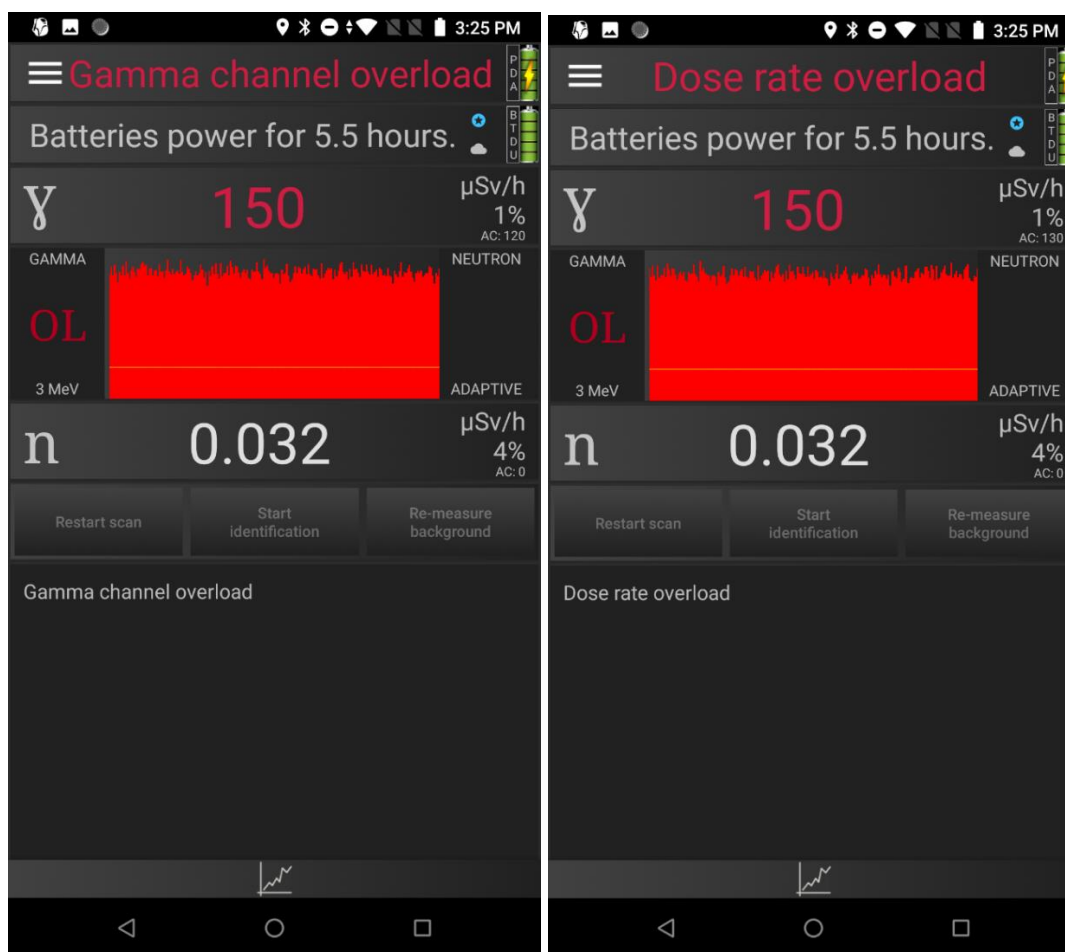


Figure 9 – Overload sub-mode

## 2.9 Waiting mode

Duration time of the “**Waiting**» mode is 30 seconds. This is the period when operator has to move to another place to prevent repeated alarm and switching to “**Identifying...**” mode in the same conditions.

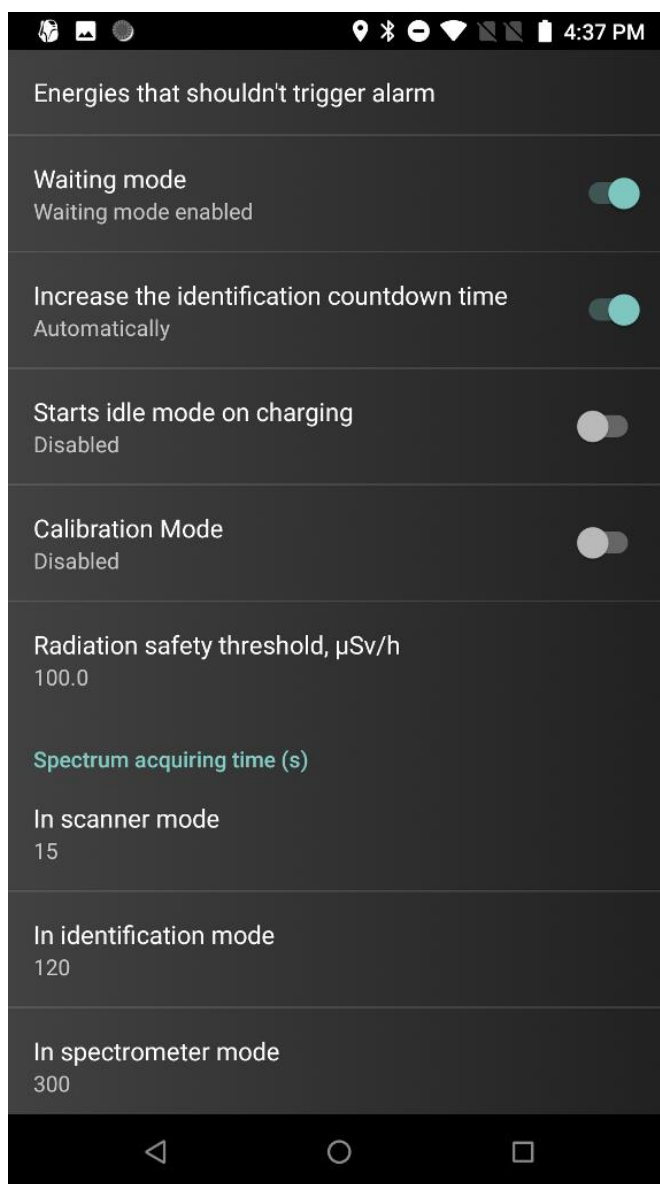
## 2.10 “Idle” mode

The “**Idle**” mode is an idle operation mode of BRD.

The BRD activates this mode in the following cases:

1. Low PDA and/or BT-DU3 adapter batteries.
2. Low PDA memory to store data.
3. Gamma channel has no calibration by energy and/or radionuclide library.
4. Gamma channel fault.

The “**Idle on charge**” option (see Figure 10) prevents using the “**Radiation Scanner Assistant**” program while charging when the AC adapter is connected. In this case the “**Radiation Scanner Assistant**” automatically switches to the “**Idle**” mode.



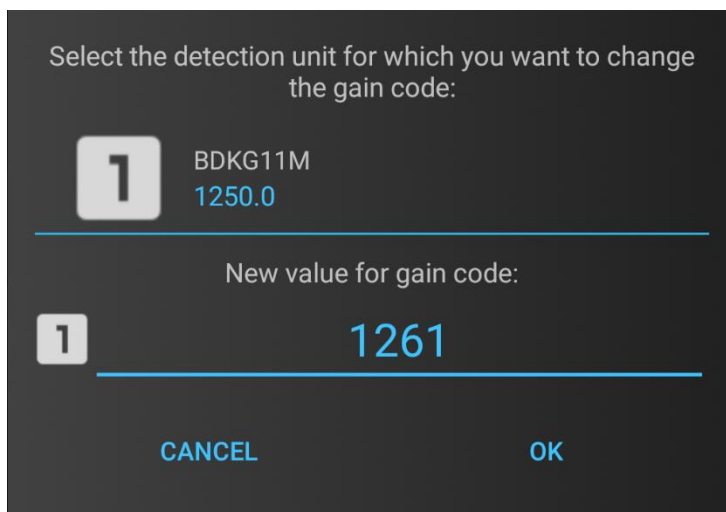
**Figure 10**

The “**Calibration Mode**” option allows connecting any DU (even neutron or wide-range DU) to the BT-DU3 adapter without having to connect spectrometric DU. It is required for BRD calibration purposes.

## **2.11 Amplification code**

To change the gain code manually select “**Menu→Gain Code**”. You need to enter the password to confirm this action. Select the DU for changing the gain code in the new

window and confirm the changes by tapping “**OK**” or tap the “**CANCEL**” button to exit the “**Gain Code**” window without any changes (see Figure 11).



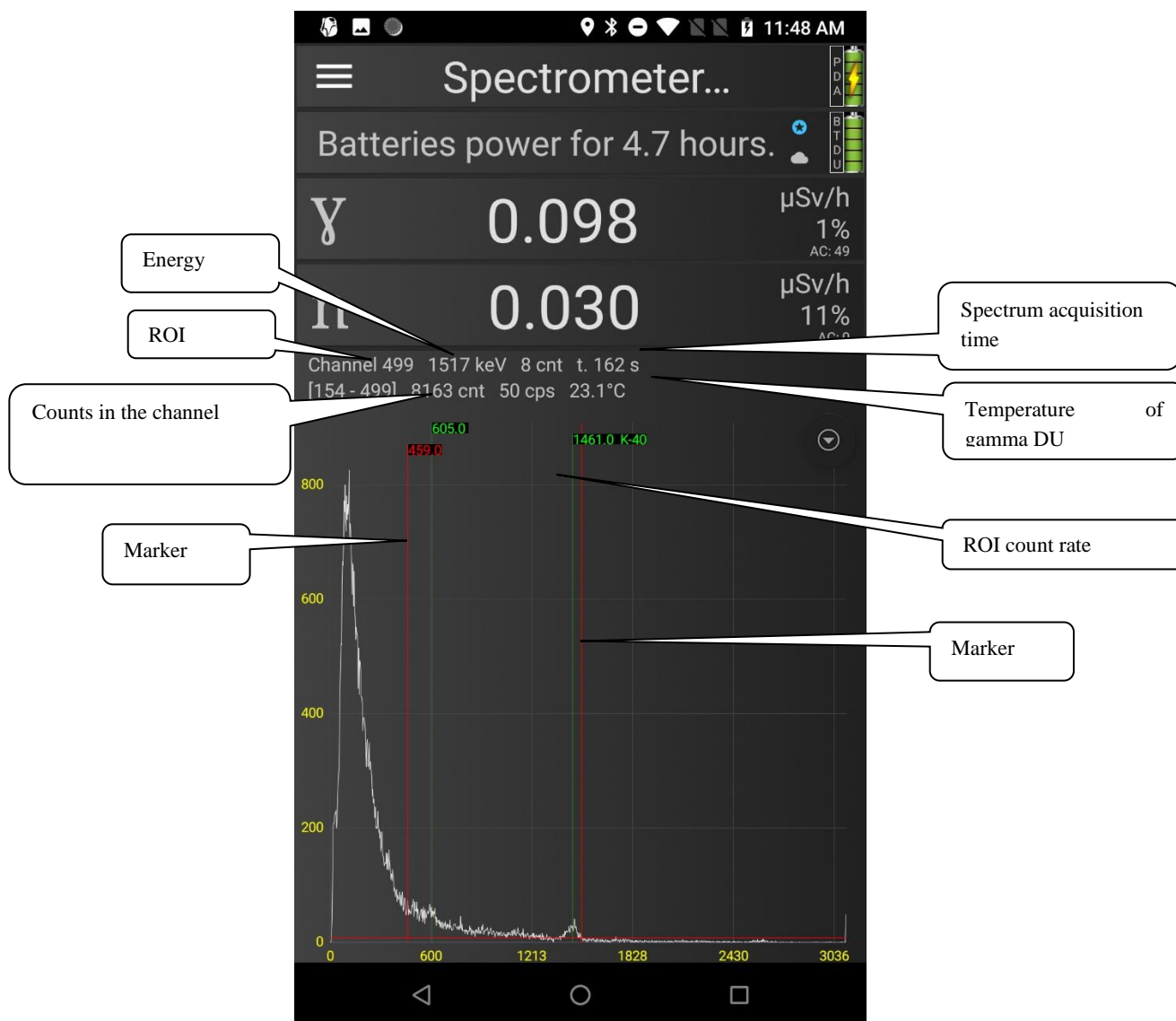
**Figure 11 – Gain code change window**

Setting the “**Gain code**” affects the compliance of measured spectrum channels with energy calibration of the DU.

## 2.12 Spectrometer mode

To enter the Spectrometric mode, select “**Menu→Spectrometric mode**”, then a window with the password input box will be displayed. If the password is correct, the spectrometric mode window is displayed (see Figure 12).

Note: Four digits of current PC time (hours and minutes) are used as a password. Example: current time is 21:45, then the password is 2145. The “**Spectrometer**” mode is used for manual spectra acquisition and processing. Radionuclides are also identified during this process.



**Figure 12 — Spectrometer mode**

If there are no two markers in a spectrum, entire spectrum is assumed as ROI, otherwise the spectrum portion between the markers (inclusive) is considered as ROI.

Total counts is calculated within the ROI.

ROI count rate is calculated as total counts divided by spectrum acquire time.

Spectrum acquire in progress is indicated by spectrum time progress.

To zoom the spectrum in or out, pinch or spread your fingers in the spectrum display area. Double-tap the spectrum display area reverts the spectrum zoom rate to default.

### 2.12.1 Spectrum controls



— Expand / collapse the spectrum controls.



– Changes the way the spectrum diagram is displayed — as a set of points, or points connected by a line.



– Changes the way the spectrum diagram is displayed — Logarithmic or linear view.



– Changes the way the spectrum values are displayed — Channel values, or corresponding energy values.



– Resumes the spectrum acquisition process according to the actually elapsed time from the acquiring start.



– Set / remove a marker.



– Open the peak parameters window: position, energy, resolution.



– Restart spectrum acquisition.

**Important!** In “**Spectrometer**” mode the program allows manual measurement results saving only.

### 2.12.2 Acquire spectrum

Set the spectrum acquisition time by going to “**Menu→Settings→General settings**”. When specified time elapses, spectrum acquisition stops. The value “**0**” sets the maximum possible value.

Restart the spectrum acquisition process by going to “**Menu→Restart acquiring**”.

Adjust the spectrum acquisition time by going to “**Menu→Set acquiring time**”. In the “**Set the time in seconds**” dialogue specify spectrum acquisition time in the range from 1 to 65535 seconds.

### 2.12.3 Save spectrum

To save a spectrum, select “**Menu→Save spectrum**”. Specify the file name and folder to save the spectrum file in the new dialogue window. The spectrum will be saved under a unique name in the “**ManualSaving**” subfolder in the program folder by default. Select the folder by tapping the folder path. Tap “**Cancel**” to cancel saving the spectrum file.

### 2.12.4 Open spectrum

To open a previously saved spectrum, select “**Menu→Open spectrum**”. Select the spectrum file in the explorer window. Use the controls to analyse the spectrum or send it

(e.g., by e-mail) to another user (see Figure 13). Tap the “**Back**” button to return to the main program window from the spectrum view window.

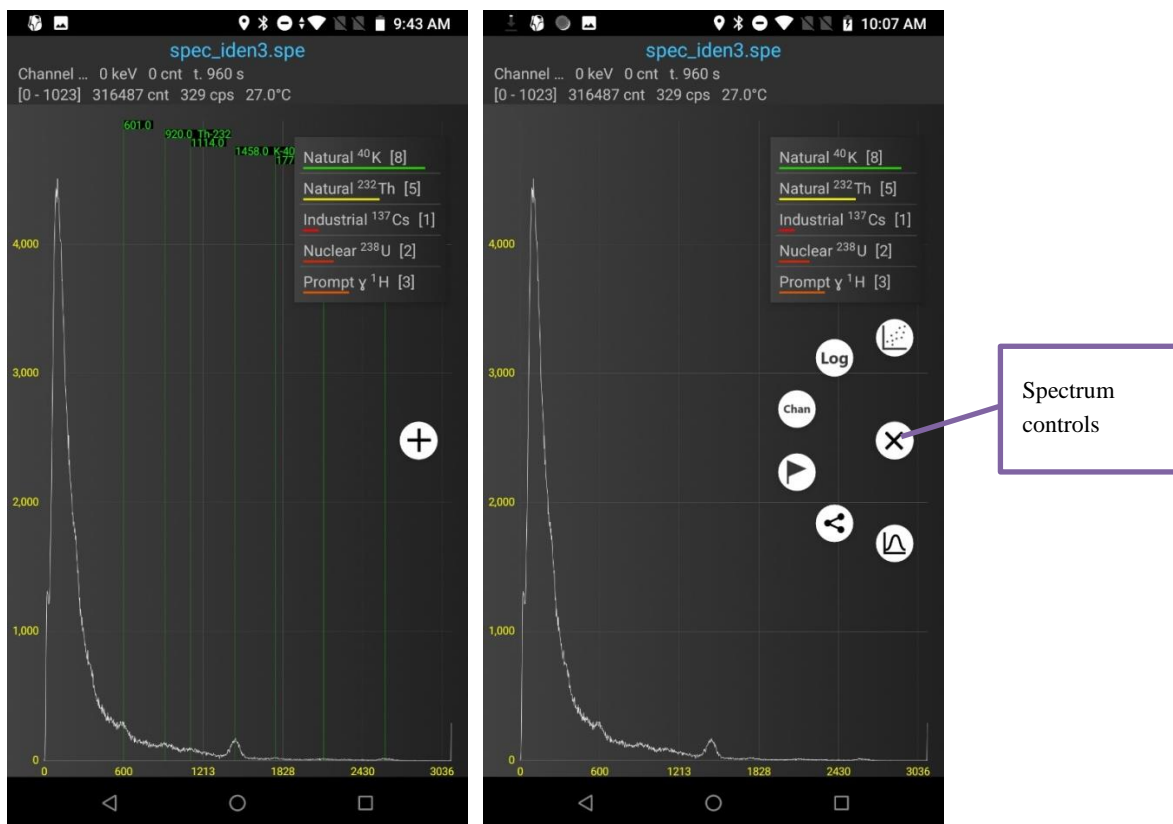


Figure 13 — View saved spectrum

## 2.13 Log view mode

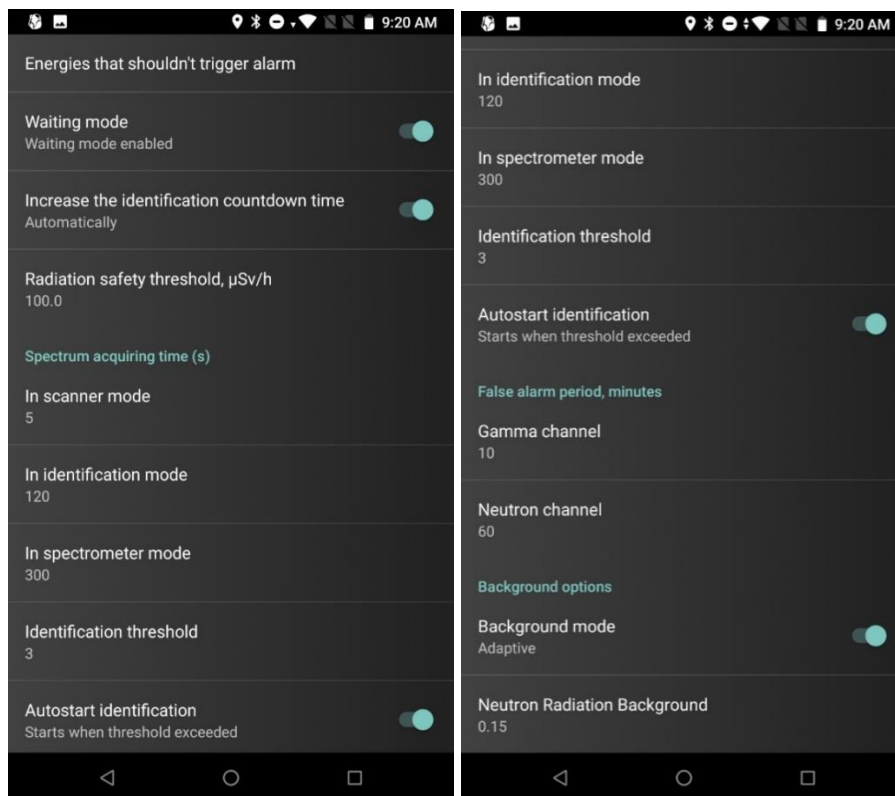
To view the event log in “**Scanning...**” mode, tap the **Program messages** field. All logs have unique names, which consist of date and time. When you completed viewing the log, click the “**Back**” button on the PDA screen.

## 2.14 General program settings

The “**Menu→Settings→General settings**” option (see Figure 14) allows to:

1. Set energies that do not trigger alarm.
2. Enable or disable Waiting mode.
3. Change the identification time manually or automatically.
4. Set the safety threshold.
5. Set the acquisition time for scanning, identification and spectrometric modes.
6. Set the identification threshold.
7. Enable or disable autostart identification.
8. Set the false alarm period value for gamma channel and neutron channel.

9. Set background options — Selecting the type of background to be acquired (adaptive or constant) for gamma channel, selecting the background value for the neutron channel.
10. Apply default settings.

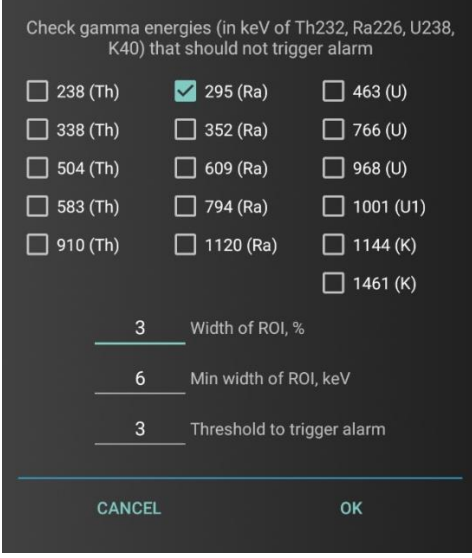


**Figure 14 General settings**

The “**Check energies that should not trigger alarm**” window shows checked energies that the program will ignore and will not trigger the alarm. (see Figure 16)



The program will not go into “**Identification**” mode when detecting these energies.



Check gamma energies (in keV of Th232, Ra226, U238, K40) that should not trigger alarm

<input type="checkbox"/> 238 (Th)	<input checked="" type="checkbox"/> 295 (Ra)	<input type="checkbox"/> 463 (U)
<input type="checkbox"/> 338 (Th)	<input type="checkbox"/> 352 (Ra)	<input type="checkbox"/> 766 (U)
<input type="checkbox"/> 504 (Th)	<input type="checkbox"/> 609 (Ra)	<input type="checkbox"/> 968 (U)
<input type="checkbox"/> 583 (Th)	<input type="checkbox"/> 794 (Ra)	<input type="checkbox"/> 1001 (U1)
<input type="checkbox"/> 910 (Th)	<input type="checkbox"/> 1120 (Ra)	<input type="checkbox"/> 1144 (K)
		<input type="checkbox"/> 1461 (K)

3 Width of ROI, %

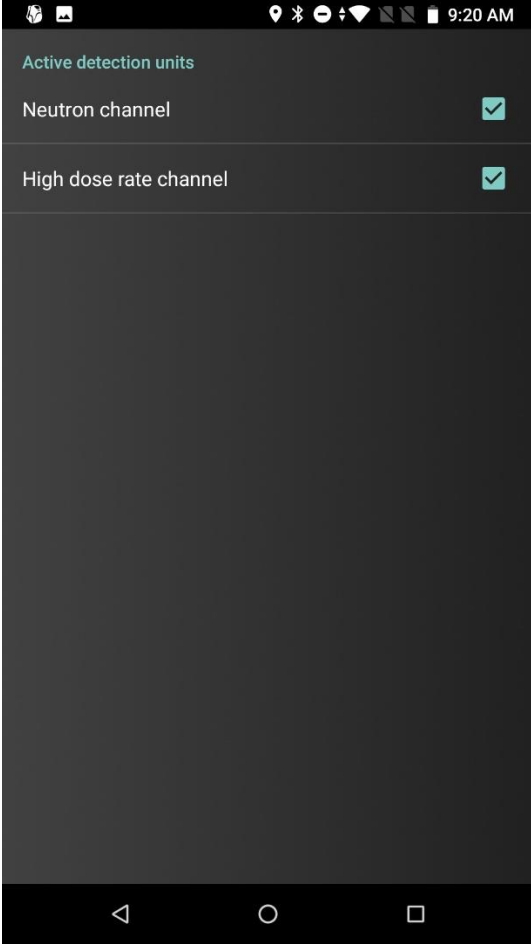
6 Min width of ROI, keV

3 Threshold to trigger alarm

CANCEL OK

**Figure 15 – Check energies that should not trigger alarm window**

Use the “**Menu→Settings→Hardware configuration**” option to specify the BRD configuration (see Figure 16).



Active detection units

Neutron channel	<input checked="" type="checkbox"/>
High dose rate channel	<input checked="" type="checkbox"/>

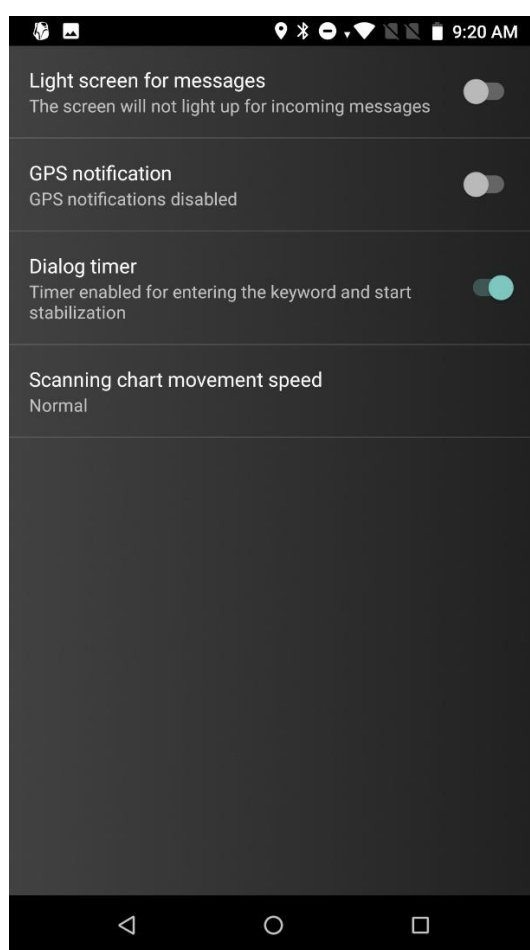
**Figure 16 — Select BRD configuration**

If a DU box in the “**Active detection units**” window is selected, the program will periodically try to establish a connection with this type of DU. If communication to the DU is lost, the program will notify the user by a voice message.

Choose “**Menu→Notifications**” to change the notification settings of the program. (see Figure 17).

The notification window has the following settings:

- Light up / do not light up the screen on incoming messages
- Enable/disable GPS notifications
- Enable/disable the timer in the keyword and start stabilization dialog boxes
- Scanning chart movement speed (**Very slow, Slow, Normal, Fast, Very fast**).

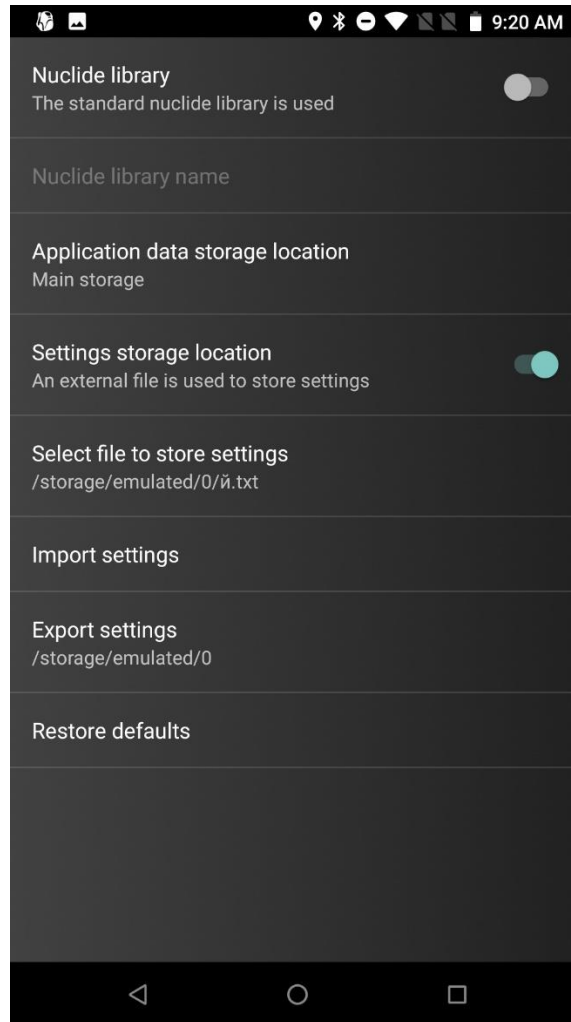


**Figure 17 – Notification settings**

Advanced configuration of the program is available in “**Menu→Manage Settings**”. (see Figure 18) The settings management window contains the following options:

- To select a custom nuclide library,
- To change the storage location of program data,
- To specify an external settings file,


- To import the current program settings,
- To export settings,
- To reset the settings to defaults.




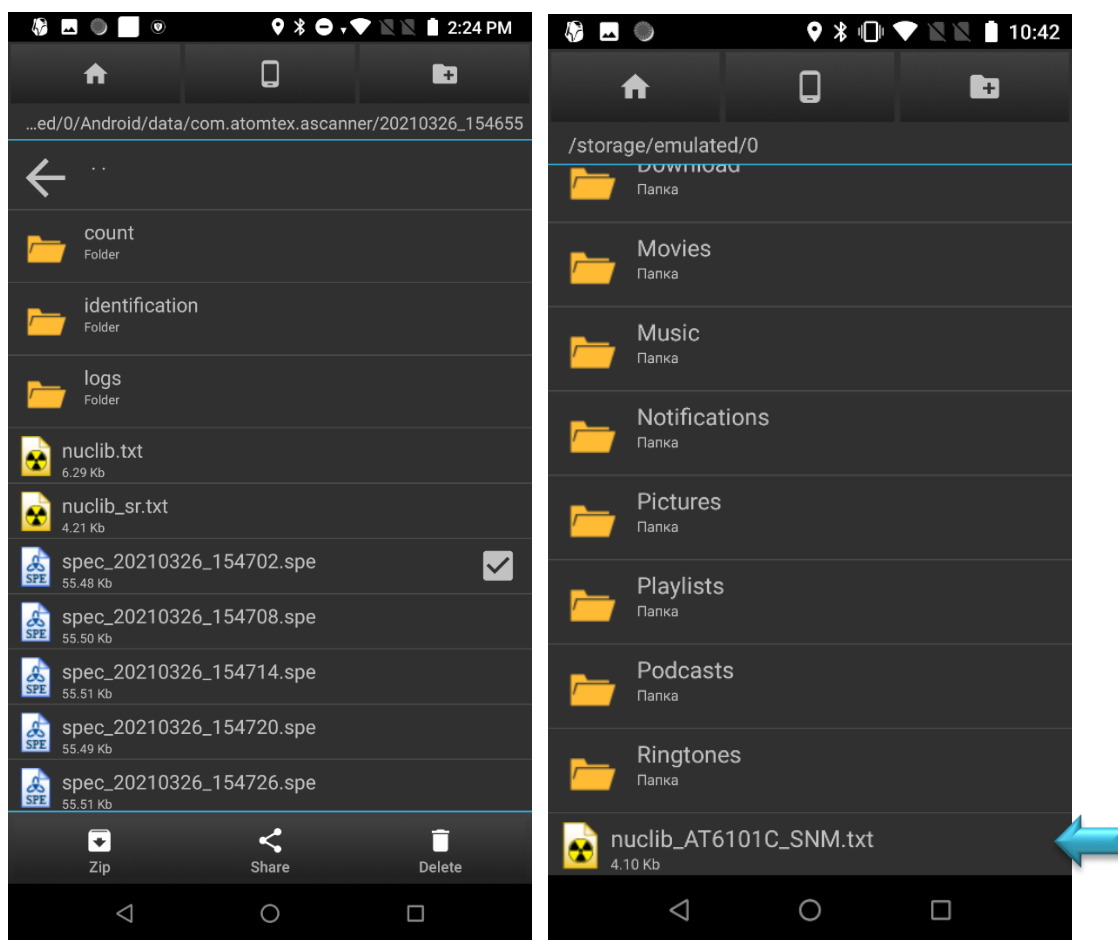
**Figure 18 — Settings management**

To use the custom nuclides library, perform the following steps:

1. Copy the library file “**nuclib\_AT6101C\_SNM.txt**” to PDA (see Figure 19) (any location, for example, to the root folder)
2. Select “**Settings→Manage settings→Nuclide library**”
3. Navigate to the folder where the library file was copied and select the file “**nuclib\_AT6101C\_SNM.txt**”, where:

 is a button to go to PDA root folder

 is a button to go one level up in the folder tree.



**Figure 19 – Selecting the custom nuclide library file**

4. The library setting status will change to “**Custom nuclide library is used**”.
5. **Important!** Restart the program to make the changes take effect.
6. Restart the program.
7. The new library is on line and working.

External settings file allows managing the program settings. When this mode is enabled, the program starts monitoring this external file and if a change occurs in it, immediately overwrites its settings with the settings in file. Changes to program settings have no effect on the settings in the external file.


This option enables settings to be controlled, for example, from another program.

You can create an external settings file yourself or use an existing file:

- a) Select file. Use this setting to navigate to settings file (.txt file extension). By selecting a settings file, file monitoring enables automatically.
- b) Create new file. By selecting this setting you can navigate to file location and specify the name of the settings file. If this file already exists, the program will either overwrite it with program settings, or the settings will be replaced with the settings from file

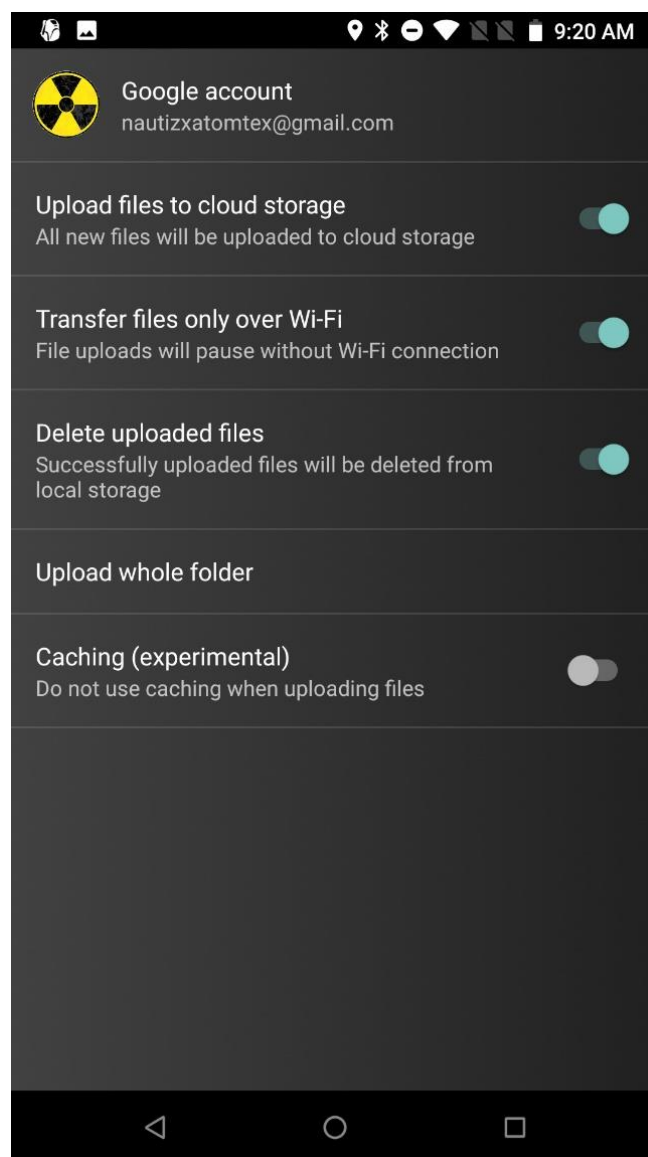
(user-selectable option). When you tap the "Save" button, the dialog box closes and file monitoring enables automatically.

The file obtained under “**Settings**→**Export Settings**” can be used as an external settings file.

The main screen icon  is displayed when external settings file monitoring option is enabled. Once the file is deleted, monitoring will be paused.


Only necessary settings can be kept in the external file, and the program will overwrite only the settings contained in the file.

## 2.15 Cloud storage



**Figure 20 – Cloud storage**

The program has a function for uploading files to a cloud storage. Use the “**Upload files to cloud storage**” option to enable it. Follow by selecting Google account.

Files will be uploaded to Google Drive in the “com.atomtex.ascanner” folder of this account. If the folder does not exist, it will be created automatically. The program screen will display the  icon. For multiple files uploading the upload process is displayed as a percentage.

Navigate to “**Menu→About**” to view the “**Radiation Scanner Assistant**” version information.

## **2.16 Data management**

To manage the data collected during BRD operation, use a file manager available in the PDA to browse for “**Device memory\Android\data\com.atomtex.scannermobile**” program folder.

You can delete, copy, move and view file and folder properties in a standard way for Android OS.

To “Share” a file(s) do the following:

1. Select the file from the list (a check-mark will be added to the selected file(s)).
2. Tap “Share” in the pop-up menu.
3. Choose transfer medium: e-mail, cloud storage, instant messaging, etc.

To transfer the data folder, it shall be archived first. Do the following:

1. Select the folder from the list (a check-mark will be added to the selected folder(s)).
2. Tap the button with three dots in the header bar. Select “Compress” in the new context menu.
3. Select an archiving method – “Compress”

To “Share” this new archive file, follow steps 1-3 for transferring a file.

Keep in mind the limitations established by the web services while sending the files.

## **3 Troubleshooting**

1. No GPS signal:
  - Make sure GPS is turned on and the PDA is in open area.
2. No connection to BT-DU3 adapter:
  - Make sure that BT-DU3 adapter is charged and turned on;
  - Make sure BT-DU3 adapter is connected to detection units by DU cables;
  - Check BT-DU3 adapter settings as described in Section 1.4.3.
3. Low memory messages in “**Radiation Scanner Assistant**”:

- “**Radiation Scanner Assistant**” stores data to PDA memory. If PDA doesn’t have enough free memory, then transfer the measurement results to a desktop computer or delete the measurement results to free the memory.
4. The program doesn’t respond:
- Restart the PDA. Check operation;
  - Reinstall the program and configure the connection with the BT-DU3 adapter. Check operation;
  - Otherwise, report the problem to manufacturer (<http://www.atomtex.com>).