



USER GUIDE

PM PRD POLIIDENTIFY SOFTWARE LAPTOP/DESKTOP EDITION



**PM1703MB
PM1703GNB
PM1703MO-1A
PM1703MO-1B**



PM1401GNB

Hardware	PM1703MB PM1703GNB PM1703MO-1A PM1703MO-1B
Software	PM PRD PoliIdentify Software Laptop/Desktop Edition
Manufacturer	Polimaster

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Reliability

The software guide has passed validity and correctness check. It contains instructions and descriptions that are considered to be true for "**PM PRD PoliIdentify Software Laptop/Desktop Edition**" as of the time of this Software Guide publication.

Documented Software and its settings are subject to change with no substantial effect on its functionality. Polimaster reserves the right to change Software in such a way not mentioning it in Software Guides.

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INTRODUCTION

NOTE ABOUT GUIDE

The Software Guide familiarizes users with technical specifications and functions of the **"PM PRD PoliIdentify Software Laptop/Desktop Edition"**.

Software Guide provides full and detailed information on **"PM PRD PoliIdentify Software Laptop/Desktop Edition"** interface structure, describes all the program functions and software-hardware communication.

GETTING STARTED

Carefully study this Software Guide before installation and first **"PM PRD PoliIdentify Software Laptop/Desktop Edition"** run. It is recommended to avoid wrong actions and to enhance software operational reliability.

Upon reading retain this Software Guide for future references.

SYMBOLS USED

The following symbols are used in the Software Guide to accentuate some important information. Symbols are given as follows:



Attention!

This mark is used in the guide to warn of something important, that may lead to data loss or hardware malfunction if ignored.



Note!

This mark is used in the guide to denote some advice or recommendations for optimum software operability.

SOFTWARE OVERVIEW

"PM PRD PoliIdentify Software Laptop/Desktop Edition" (further - software), developed by the Polimaster company, is installed on personal computer (further – PC). Software is intended to be used with "PM1703XXX¹" and "PM1401XXX¹" instruments (further - instrument) manufactured by Polimaster company.



Attention!

Any attempt to communicate with other devices using this software may have unpredictable results.

"PM PRD PoliIdentify Software Laptop/Desktop Edition" communicates with PM1703XXX¹ instruments by:

1. Wireless communication device:
Bluetooth adapter (with USB interface or internal one).
2. **USB – interface.**
Instrument connects to PC by USB-cable.



Attention!

- ➔ Refer to corresponding Operation Manual on PM1703XXXX¹ to find out instrument interface type (Bluetooth, USB-cable);
- ➔ Connect and adjust Bluetooth module according its in-line documentation.



Note!

Software user must have at least initial experience in working with PC under Windows family operation systems to operate "PM PRD PoliIdentify Software Laptop/Desktop Edition".

¹ **XXXX** – alphanumeric code to identify the instrument in the instrument product line. Code is stated in the instrument Operation manual and denotes software-instrument communication type.

SOFTWARE APPLICATION RANGE

"PM PRD PoliIdentify Software Laptop/Desktop Edition" enables on-line control over radiation environment along with simultaneous **Bluetooth\USB** transfer of information to PC in a command or expert center. Transferred information is being processed and analyzed to generate corresponding databases.

Software is used to:

- Increase work efficiency of the Radiation control services, Ministry of Emergency Situations, Security Services and Customs, as well as personnel engaged in detection of local radiation sources or particular objects contaminated with radioactive nuclides (e.g., determination of radioactive contamination of waste, scrap metal and other objects);
- Transfer current information (measurement data, instrument settings, etc.) on radiation situation of the controlled area or object in on-line mode from the instrument to PC;
- Proper hazard evaluation of detected contamination on-the-spot by precise identification of material radionuclide composition according to spectrometric analysis of the test material;
- Early warning of possible radiation contamination or act of terrorism;
- Providing safety when eliminating damage caused by technogenic accidents as well as when using ionization radiation sources during scientific research.

SOFTWARE FUNCTIONS

- 1. Bluetooth/USB connection to instrument;**
- 2. Remote control over instrument operation;**
- 3. On-line transfer of alarm information (gamma and neutron emission) to PC;**
- 4. Reads information (events) from instrument non-volatile memory (instrument operation history);**
- 5. Saves accumulated instrument operation history to PC, enables its viewing, printing and deletion from instrument memory;**
- 6. Limits area of viewed history by set filtering criteria (time interval, event type);**
- 7. Initiates the scintillation spectrum accumulation in the instrument. Displays the process on PC screen;**
- 8. Saves accumulated spectrum to PC in operator selected format:**
 - *.spe – for Identify program,
 - *.xml – according to ANSI 42.42 standard;
- 9. Identifies the material radionuclide composition according to accumulated scintillation spectrum analysis;**
- 10. Transfers following data to NPNET system on timely basis or under "Alarm" condition:**
 - **current dose rate value (gamma measurement),**
 - **accumulated scintillation spectrum file,**
 - **geographical coordinates;**
- 11. Configures instrument settings and functions:**
 - **History recording interval into instrument non-volatile memory,**
 - **Internal microprocessor and PC time synchronization,**
 - **Forced history cleaning,**
 - **Sound alarm On/Off,**
 - **Vibro-alarm On/Off,**
 - **Gamma- and neutron channels alarm thresholds,**
 - **Dose rate equivalent (further - DER) threshold,**
 - **Dose equivalent (further – DE) threshold,**
 - **Energy Calibration mode parameters,**
 - **Identification mode parameters;**
 - **Autocalibration mode parameters.**

SYSTEM REQUIREMENTS

System requirements for "PM PRD PoliIdentify Software Laptop/Desktop Edition" installation and its proper operation:

PC REQUIREMENTS

- ➔ IBM PC – compatible PC with Pentium III processor or higher;
- ➔ 1 GB free HDD space;
- ➔ CD-ROM (for software installation);
- ➔ Operation system:
 - Microsoft Windows Vista¹,
 - Microsoft Windows XP¹ Professional,
 - Microsoft Windows 2000 Professional;
- ➔ USB port.

PEROPHERY REQUIREMENTS

- ➔ Printer (to print reports).

ADDITIONAL EQUIPMENT REQUIREMENTS

For instruments with Bluetooth-interface²:

- ➔ Bluetooth device (USB or internal) with any drivers installed:
 - Microsoft Windows XP (**SP2 or higher**),
 - Widcomm¹ or Broadcomm (**4.x.x.x or higher**),
 - IVT Corporation (BlueSoleil) (**5.1.x.x or higher**).

For instruments with USB-interface²:

- ➔ miniUSB - USB – cable



Note!

Connect and adjust Bluetooth device according to its operation manual.

¹ Software installed on PC under 64-bit OS (Microsoft Windows XP 64, Microsoft Windows Vista 64) doesn't support Widcomm driver.

² Instrument supported interface type is stated in its Operation Manual.

**Attention!**

Bluetooth device MUST support Bluetooth serial port (SPP) protocol.



GPS function realization –geotagging¹ function of current DER value measured in Gamma measurement mode **requires external GPS module or internal one connected to PC. GPS module must possess following specifications:**

- support of NMEA data communication protocol,
- transfer of standard minimum GPS data set (RMC command type).

¹ Geotagging is the process of adding geographical identification metadata to various media. This data usually consist of latitude and longitude coordinates, though they can also include altitude, bearing, accuracy data, and place names. In our case we deal with latitude and longitude coordinates only. In this guide we use “geotag” and “geotagging” terms to define the reference of measured DER value to the instrument’s location data (geographic coordinates).

RECOMMENDED INITIAL PROCEDURE

FOR INSTRUMENTS WITH BLUETOOTH-INTERFACE¹:

1

Install “*PM PRD PoliIdentify Software Laptop/Desktop Edition*” software to PC.

[Software Installation](#)

2

Connect and adjust Bluetooth device according to its Operation Manual.

3

Start “*PM PRD PoliIdentify Software Laptop/Desktop Edition*”.

[Program Start](#)

4

Switch the instrument on and initiate its Bluetooth connection according to Operation Manual on the instrument.

[Initialize Bluetooth–Communication in Instrument/Software-Instrument Connection Procedure](#)

5

Select driver of installed Bluetooth device responsible for software-instrument communication in the *Instruments List* window.

[Communication Settings](#)

6

Connect instrument to software according to the following chapters:

[Software-Instrument Connection Procedure](#)

[Connect Instrument](#)

7

PM PRD PoliIdentify Software Laptop/Desktop Edition is ready to work with the instrument.

¹ Instrument supported interface type is stated in its Operation Manual.

FOR INSTRUMENTS WITH USB INTERFACE¹:

1

Install "*PM PRD PoliIdentify Software Laptop/Desktop Edition*" software to PC but don't start it.

[Software Installation](#)

2

Switch the instrument on. Connect instrument to PC by miniUSB-USB cable from delivery kit according to instrument's Operation Manual.

3

System finds new hardware connected. Driver for PM1703XXXX instruments is installed automatically during software installation.

4

Start "*PM PRD PoliIdentify Software Laptop/Desktop Edition*" software.

[Software Installation](#)

5

Select *File/Instruments Lists* or click *Instruments List* icon on the main program window toolbar, and use drop-down list of the *Communication way* field to select *USB Cable* as communication way.

[Communication Settings](#)

6

Connect instrument to software according to the following chapters:

[Software-Instrument Connection Procedure](#)

[Connect Instrument](#)

7

PM PRD PoliIdentify Software Laptop/Desktop Edition is ready to work with the instrument.

¹ Instrument supported interface type is stated in its Operation Manual.
Software Guide

SOFTWARE INSTALLATION



Close all active Windows applications prior to software installation.


To install **"PM PRD PoliIdentify Software Laptop/Desktop Edition"** do the following procedure.

Insert the supplied CD with **"PM PRD PoliIdentify Software Laptop/Desktop Edition"** installation package into the computer's CD drive.

PROGRAM AUTORUN

If autorun function is set to enabled on the PC, **Disk Browser** will be started automatically. At that the following window will be displayed:



Opened window first of all suggests the operator to choose interface language of the **Disk Browser**. After that the very **Disk Browser** opens. Press  **Exit** to close autorun when required.



- **Install Software** – press to start installation of "PM PRD PoliIdentify Software Laptop/Desktop Edition";
- **View Software Guide** – press to view documentation on installation, setting and operation of software as well as its communication with hardware;
- **Install Adobe Acrobat Reader** – end user documentation is saved as a (*.pdf) file. Acrobat Reader must be installed on PC in order to open or view it. User, having chosen this option, initiates installation of Adobe Acrobat Reader 9.0 onto his/her PC;
- **Back** – press to return to the previous window of **Disk Browser**.

Press  option to start installation of "PM PRD PoliIdentify Software Laptop/Desktop Edition" (see **Installer** chapter below).

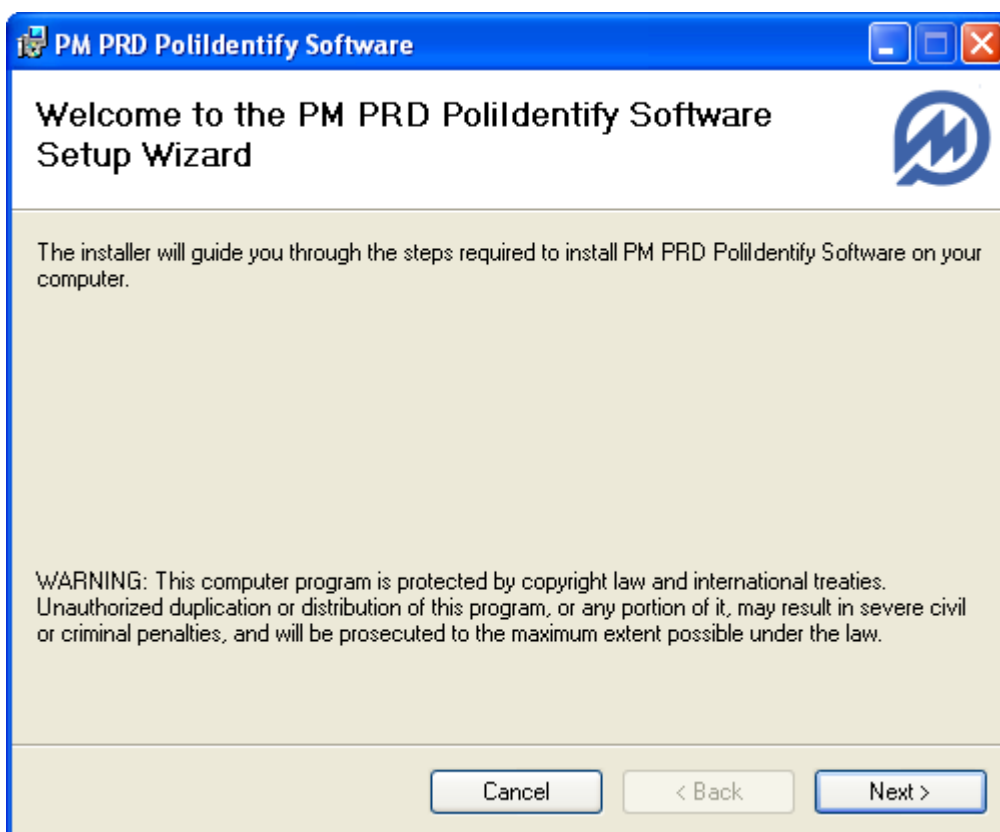
When installation is completed, press  button to close window of **Disk Browser**.

FORCED INSTALLATION START

If autorun function is set to disabled on PC, no above mentioned window opens. If so, insert supplied installation CD into computer's CD drive and follow on-the-screen commands. Run the **setup.exe** from CD's root directory to initiate installation of "**PM PRD PoliIdentify Software Laptop/Desktop Edition**" and corresponding documentation.

INSTALLER

Installer is a master – a program that divides the installation process into several simple steps. Master lets the user going any steps back if required. Every step is accompanied by a dialog window displaying comments to the suggested actions.



When all the required steps are done, press **Next** button. Press **Back** button if going back to the previous step is required. Installation process can be aborted any time by pressing **Cancel** button.



Observe all requirements of *master* during installation.
By default the software is installed into *Program Files\Polimaster* folder.

When installation is completed, start software by pressing **Start** button and then click **Programs > Polimaster > PM PRD PoliIdentify Software > PM PRD PoliIdentify**.

"**PM PRD PoliIdentify Software Laptop/Desktop Edition**" installer creates all necessary shortcuts in the main Windows menu during installation process.

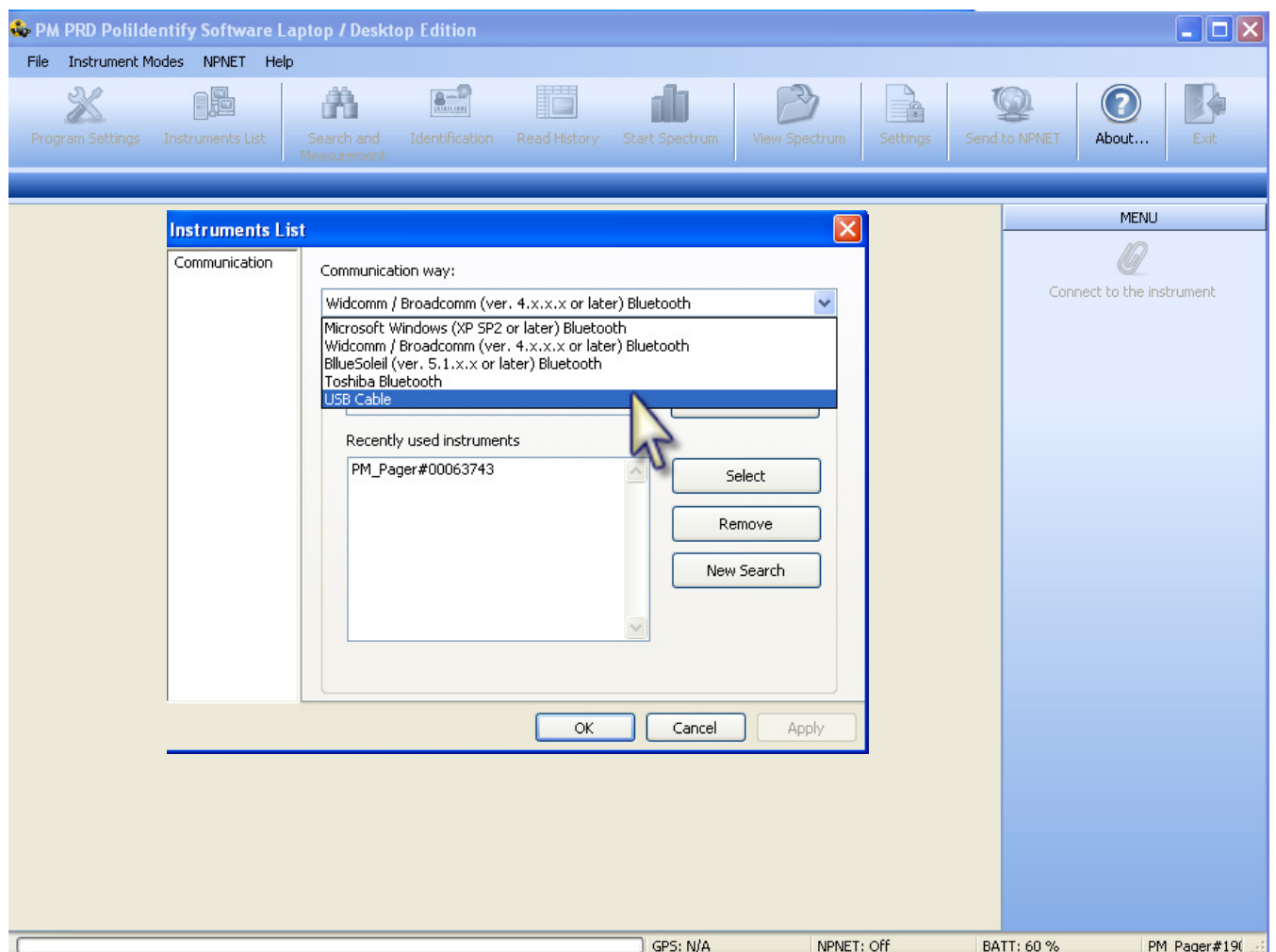
SOFTWARE START



"PM PRD PoliIdentify Software Laptop/Desktop Edition" installer creates all necessary shortcuts in the main Windows menu during installation process.

Program start from the main Windows menu: *Start > Programs > Polimaster > PM PRD PoliIdentify Software > PM PRD PoliIdentify*.

Successful program start displays **PM PRD PoliIdentify Software Laptop/Desktop Edition** main program window. English interface is set by default (see **Program Settings/Select Program Interface Language**).



Instruments List dialogue window opens above main program window at first software start. Choose communication way or installed Bluetooth device driver responsible for software-instrument communication (see **Program settings/Communication Tab**).

PROGRAM EXIT

Use one of the following ways* for proper program exit:



*Select *File* menu and click *Exit* command;



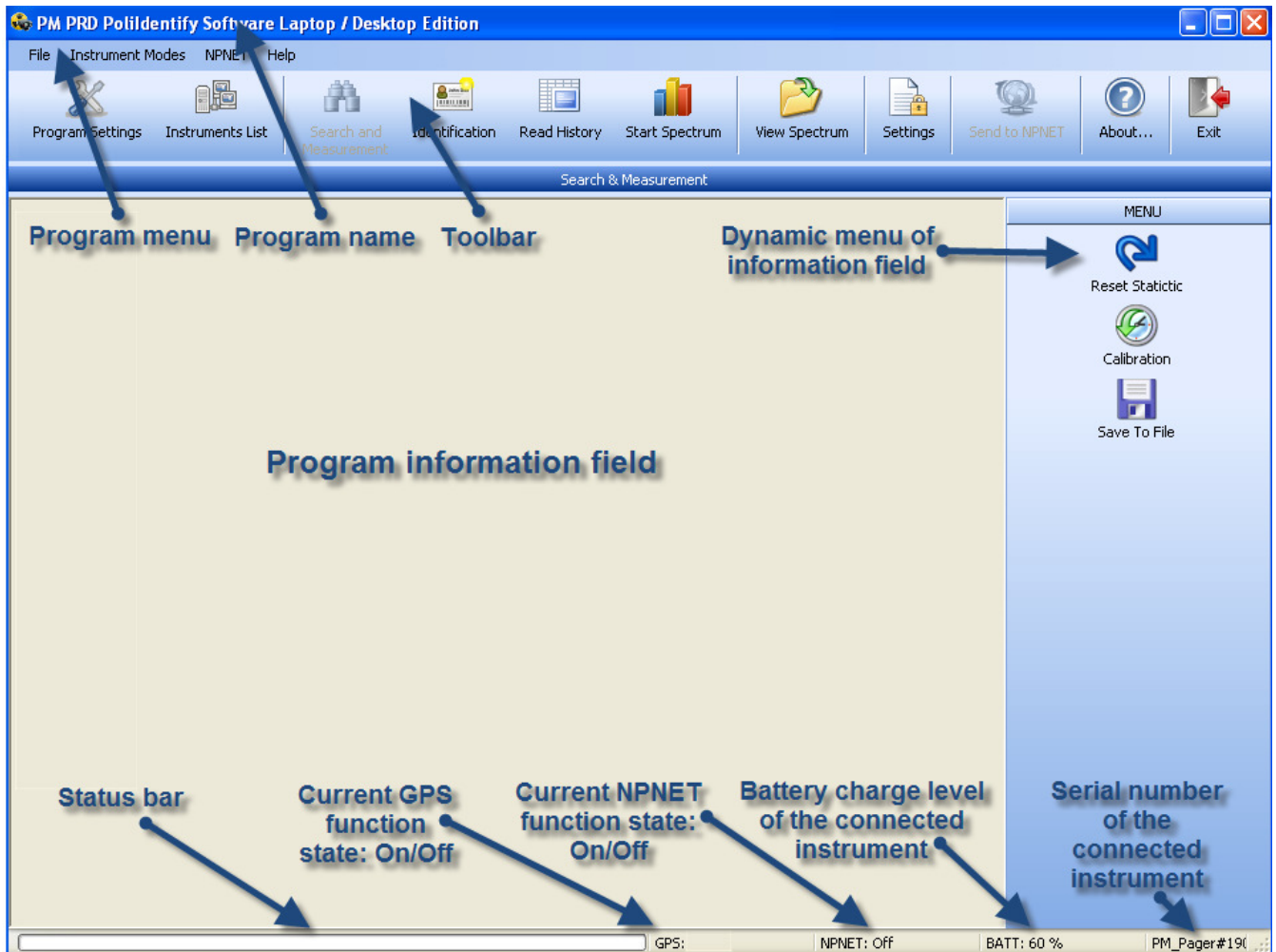
*Press this toolbar button;



*Press this window button.

MAIN PROGRAM WINDOW

Simple graphical interface of the main program window represents set of tools and commands. With their help PC operator controls program operation, connected instrument and database.



Main program Window Structure:

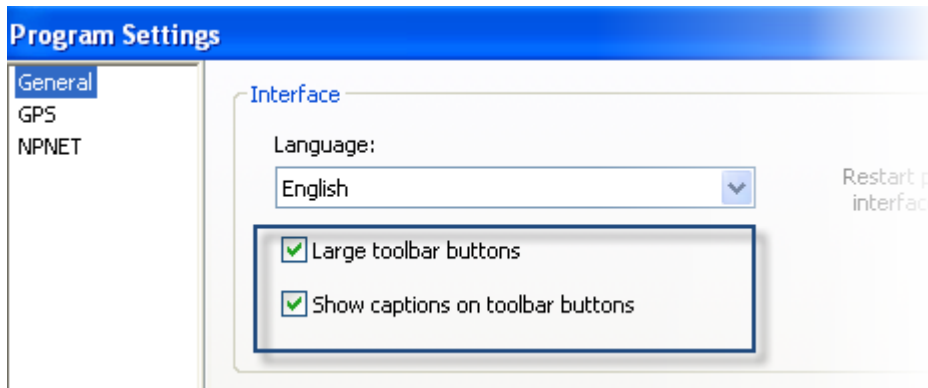
➔ Main program window **Menu** (File, Instrument Modes, NPNET, Help).

➔ **Toolbar** of the main program window.

Toolbar is located under main window menu. Toolbar buttons correspond to most frequently used menu commands. Point mouse cursor to the button, not pressing it, and see a pop-up window prompting name of corresponding command.

Click **Program Settings/General** to adjust toolbar buttons appearance.

Large toolbar buttons and *Show captions on toolbar buttons* options are enabled by default in *Program Settings* (see main program window screen-shot above).



Restart software for new settings take effect.

➔ **Information field.**

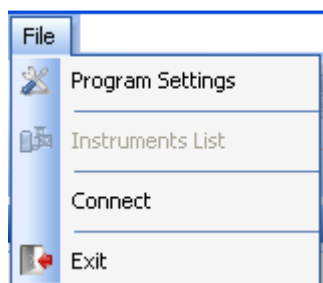
Dynamic field displaying corresponding window when PC operator clicks command.

➔ **Status bar** is located in the lower part of the main program. It displays information on current software status.

Detailed description of all the commands and functions of the main program window and toolbar is given further in the Guide.

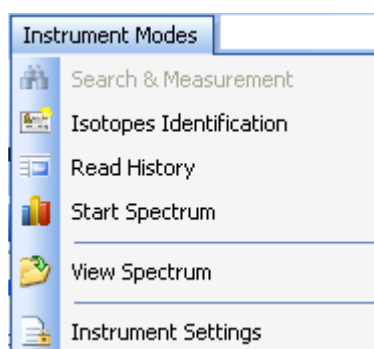
MAIN PROGRAM WINDOW MENU

File menu commands:



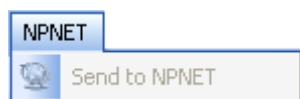
- Enter *Program Settings* window;
- Enter *Instruments List* window enabling user to select PC-instrument communication way and see instruments list;
- Connect software to selected instrument;
- Program exit.

Instrument Modes menu commands:¹



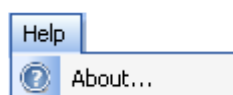
- Switch instrument into mode of *gamma/gamma-neutron search and measurement of photon emission DER*;
- Switch instrument into mode of *matter radionuclide composition identification*;
- Start reading history from instrument;
- Switch instrument into mode of *photon emission scintillation spectra accumulation*;
- Switch instrument into mode of *photon emission spectrum view*;
- Start reading *instrument operation settings*.

NPNET menu commands:



- Start information transfer to NPNET system.

Help menu commands:



- Information on installed software version.

¹ Commands are available only if software communicates with instrument.

TOOLBAR

Toolbar buttons duplicate basic commands of the main program window menu. Toolbar buttons enable easy and quick navigation through the program. Click **Program Settings/General** or select **File** menu in the main program window and click **Program Settings** command to adjust toolbar buttons appearance.



Program Settings button

Function: enters *Program Settings* window.



Instruments List button

Function: enters *Instruments List* window.



Search and Measurement button

Function: switches instrument into mode of *gamma/gamma-neutron search and measurement of photon emission DER*.



Identification button

Function: switches instrument into mode of *matter radionuclide composition identification*.



Read History button

Function: starts reading history from instrument.



Start Spectrum button

Function: switches instrument into mode of *photon emission scintillation spectra accumulation*.



View Spectrum button

Function: opens view window of accumulated and saved to PC spectrum of photon emission.



Settings button

Function: starts reading instrument operation settings.



Send to NPNET

Send to NPNET button

Function: starts information transfer to NPNET system.



About...

About button

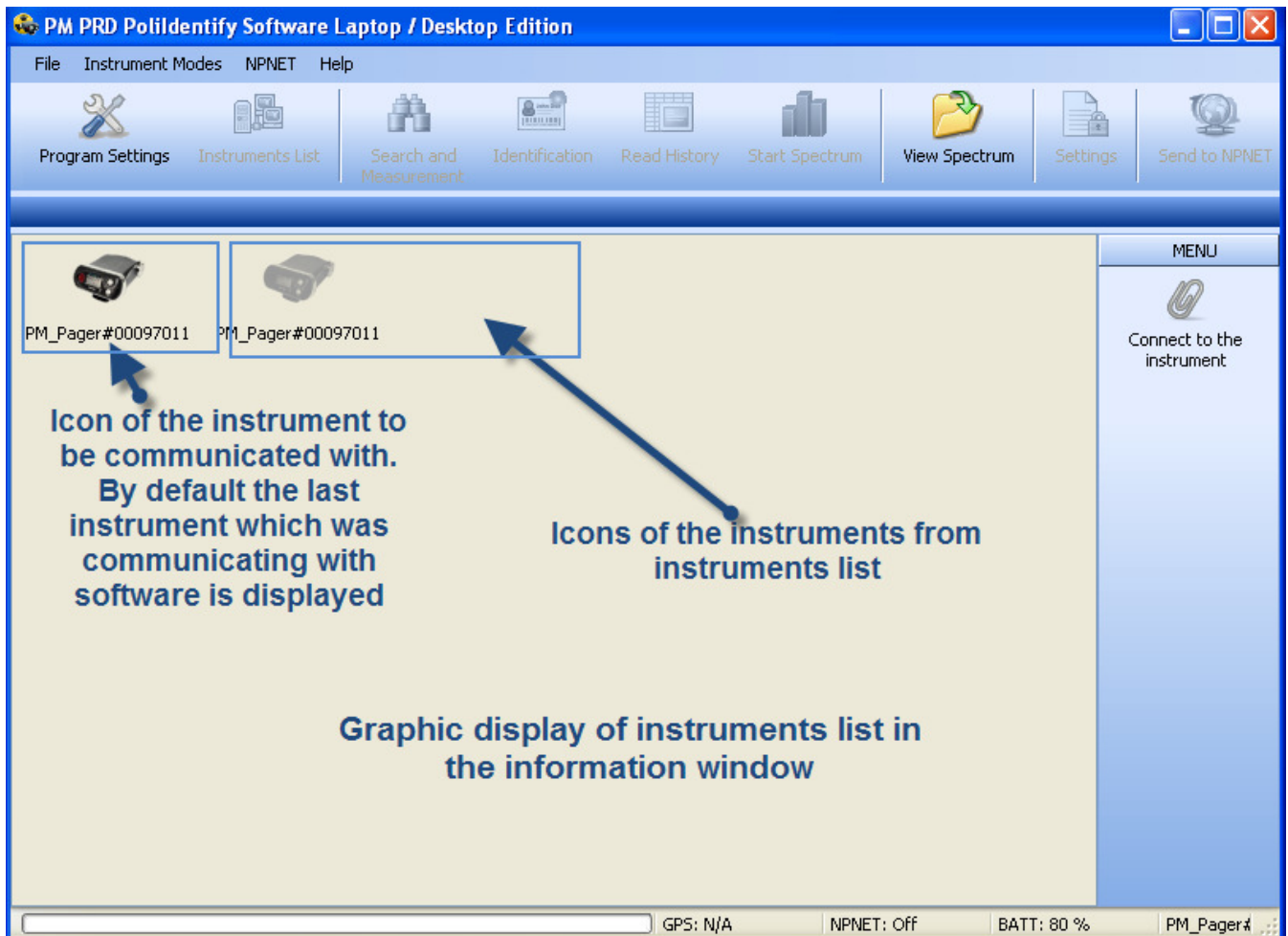
Function: opens window with information on software version.



Exit

Exit button

Function: closes main program window. Program exit.



Current software version enables connection with two types of instruments, though instrument icon is a common one represented by PM1703xxxx instrument.

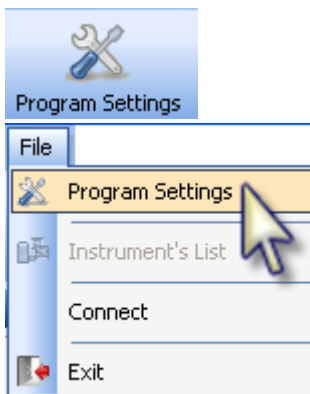
PROGRAM SETTINGS

PC operator (software user) **must** adjust software settings of "**PM PRD PoliIdentify Software Laptop/Desktop Edition**" before starting working with it.



Instruments List dialogue window opens above main program window at first software start. Choose here **Communication way: USB Cable** or installed Bluetooth device **driver** responsible for software-instrument communication (see [Instruments List](#)).

Use one of the following ways* to enter *Program Settings* window:



* Press this toolbar button;

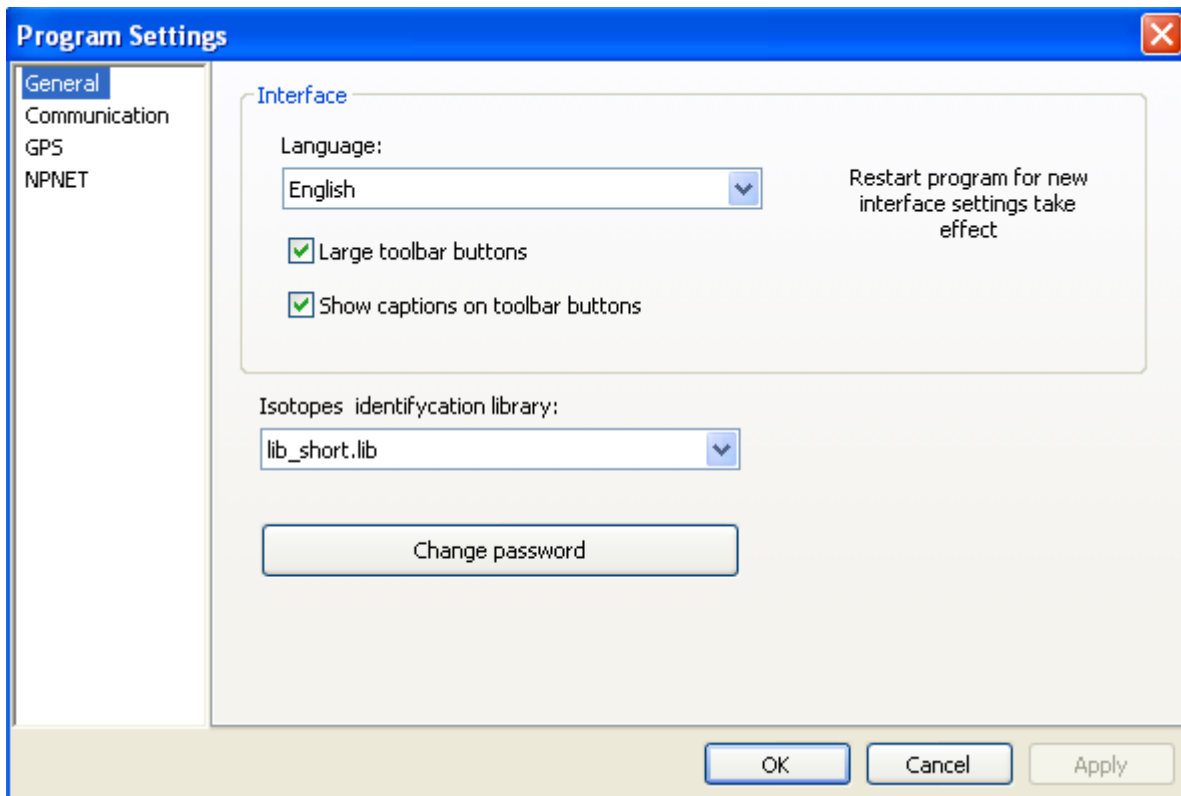
* Select *File* menu and click *Program Settings* command.

Select corresponding tab of the *Program Settings* window left panel and adjust required settings.

GENERAL PROGRAM SETTINGS

Select Interface Language/Change Password

General Tab



✦ **Language** — use drop-down window to choose software interface language. Current software version lets operator choose between English and Russian interface languages. English language is set by default.



Restart program for new interface settings take effect.

Use following options to adjust appearance of toolbar buttons according to PC display size:

✦ **Large toolbar buttons**


Flag this check box to display large-sized toolbar buttons. Unflag to display them as small ones;


Show captions on toolbar buttons

Flag this check-box to display captions on the toolbar buttons. Unflag to display them without captions.



Restart program for new toolbar settings take effect.

 **Isotopes identification library** — use drop-down list to choose isotopes library to be used in **Identification** mode. Highlight required line to activate corresponding isotopes library. Doing so, isotopes identification mode will be realized within the selected library¹. By default the *Lib_ful.lib* library with complete isotopes list is activated (**Appendix A**).

 **Change password** — enables operator to change access password to **PM1703XXXX** instrument settings.

By default set access password after software installation – "1".

To change password: enter current password in the *Restricted Access* window, and then enter new password in the *New password/Confirm password* fields of the *Change Password* window.

Password is case sensitive.

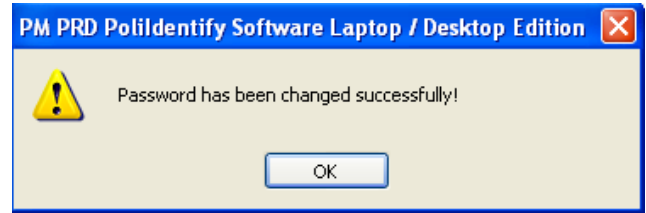
Show password – flag this check-box to display entered password.



Press **OK** to confirm new password.

¹ Isotopes identification mode is realized within the selected library.

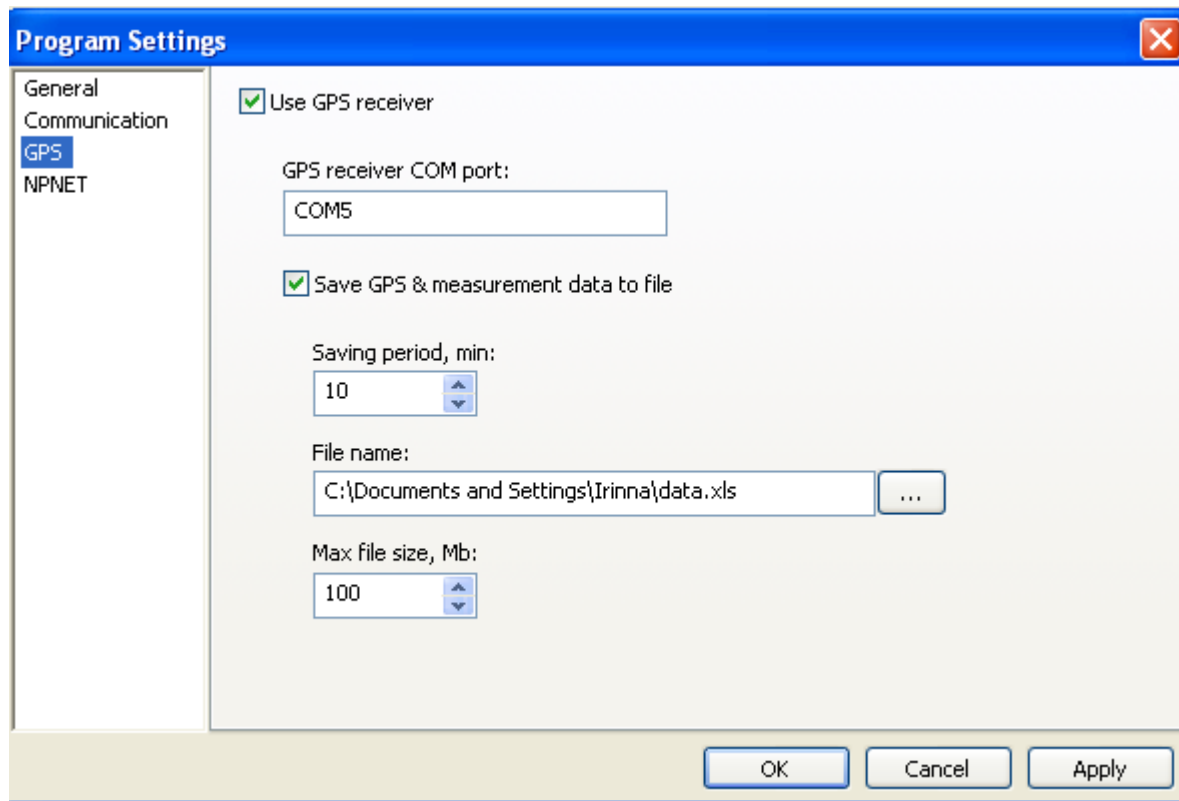
If all conditions are met, software accepts new password. Otherwise the following error message will be displayed:



Press **OK** to save new settings.

GPS Function Settings

GPS Tab



GPS function realization –geotagging¹ function of current DER value measured in Gamma measurement mode **requires external GPS module (USB) or internal one) connected to PC. GPS module must possess following specifications:**

- support of NMEA data communication protocol,
- transfer of standard minimum GPS data set (RMC command type).

¹ Geotagging is the process of adding geographical identification metadata to various media.

This data usually consist of latitude and longitude coordinates, though they can also include altitude, bearing, accuracy data, and place names. In our case we deal with latitude and longitude coordinates only. In this guide we use “geotag” and “geotagging” terms to define the reference of measured DER value to the instrument’s location data (geographic coordinates).



Connect and adjust GPS module observing its in-line documentation.

➤ **Use GPS receiver** — flag this check-box to enable geotagging of DER values measured in Gamma measurement mode, and provide access to further settings of this software function.

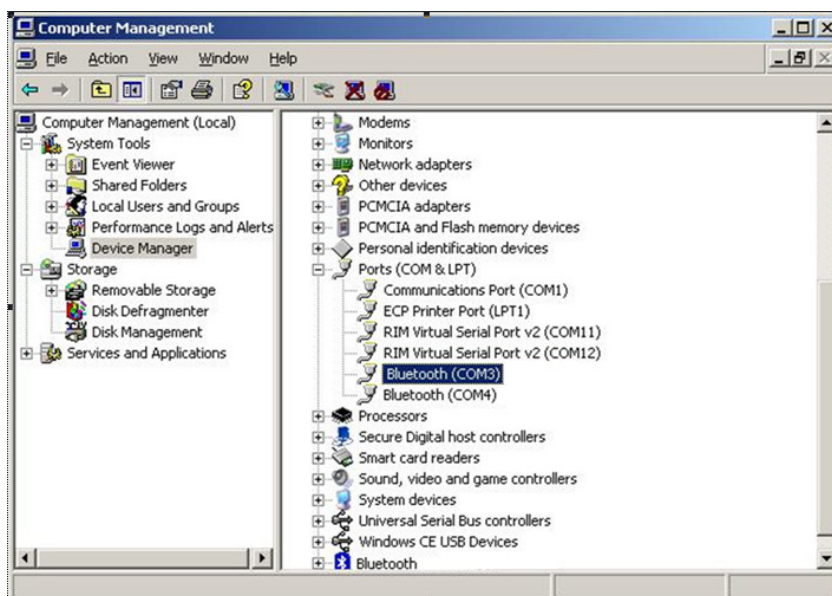
➤ **GPS receiver COM port** — enter number of virtual serial COM port to enable communication between GPS module and software. COM port number is generated by GPS module driver.

To find out virtual COM port number:

— refer to GPS device in-line documentation,

or


— refer to PC properties. Doing so, open **Device Manager** window (*My Computer – (right-click) Properties – Hardware tab - Device Manager*). Select **COM Ports and LPT**. Specify COM-port number assigned to the connected GPS module.



➤ **Save GPS and measurement data to file** — flag this checkbox to enable saving geotagged doze rate measurement data into (*.xls)¹ file.

¹ Open saved files by MS Excel (to provide validity of information display).

➤ **Saving period, min** — successive time interval at which current DER measurement value is saved into a file in the form of geotagged (geo-referenced) data (specifying longitude/latitude).

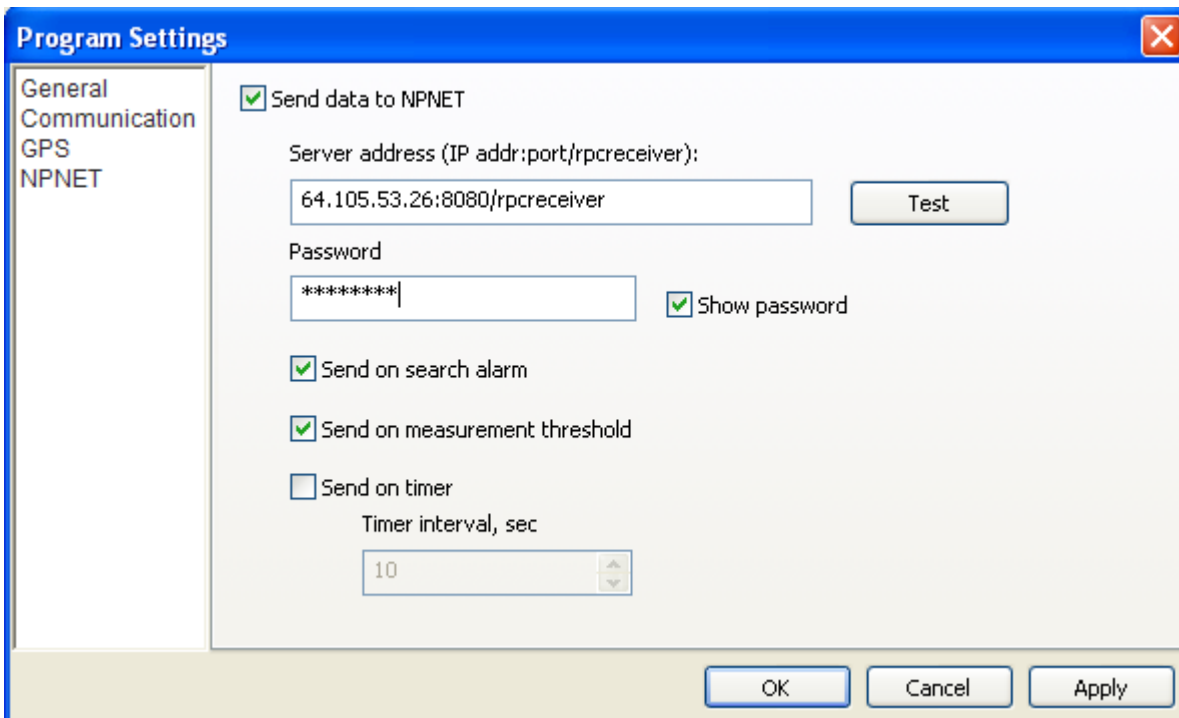
➤ **File name** — specify filename and path for GPS data to be saved in. Press  button to open standard *Save As* window. Set file name and destination folder there to save *.xls file.

➤ **Max. file size, Mb** – Set here maximum allowed file size for GPS data to be saved in.

Press *Apply* to save new settings.

NPNET Networking Settings

NPNET Tab



Program Settings

General
Communication
GPS
NPNET

☒ Send data to NPNET

Server address (IP addr:port/rpcreceiver):
64.105.53.26:8080/rpcreceiver Test

Password
***** ☒ Show password

☒ Send on search alarm

☒ Send on measurement threshold

☐ Send on timer
Timer interval, sec
10

OK Cancel Apply

➤ **Send data to NPNET** — flag this check-box to enable transfer of the following geotagged data (depending on the instrument operation mode):

- current DER measured value;
or
- accumulated spectra;

to NPNET geo-information mobile system. Flagging provides access to further settings of this function.

➡ **Server address** — specify NPNET **web-server** address where instruments' data are being collected, analyzed and estimated.

➡ **Password** — specify access password (identification entry code) for the instrument outgoing data to specified NPNET **web-server**.

➡ **Show password** – flag this check-box to display entered password.



Note!

Refer to NPNET system administrator if you want to change server address and access password to NPNET system.

➡ **Send on search alarm** — flag this check-box to enable automatic transfer of **current DER measured value** and **geographic coordinates** to NPNET system if set DER threshold is exceeded while in **Search** mode.

➡ **Send on measurement threshold** — flag this check-box to enable automatic transfer of **current DER measured value** and **geographic coordinates** to NPNET system if set DER threshold is exceeded while in **Gamma measurement** mode.

➡ **Send on timer** — flag this check-box to enable automatic transfer of **current DER measured value** and **geographic coordinates** to NPNET system at user set time interval while in **Gamma measurement** mode.

➡ **Time interval, sec** — successive time interval at which **current geotagged measured DER value** is send to NPNET system web-server.

Press *Apply* to save new settings.

Save Program Settings



Save new settings each time you configured program settings or changed any parameter.

Press ***Apply*** on the lower window panel when you are finished with settings and configuration.

Press ***Cancel*** on the lower window panel when you want to cancel changes.

INSTRUMENTS LIST

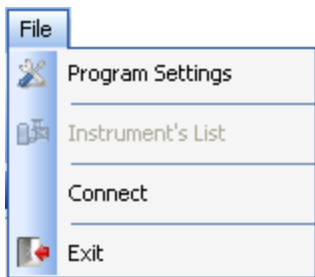


Instruments List dialogue window opens above main program window at first software start suggesting user to adjust initial software settings. Choose here **Communication way: USB Cable** or installed Bluetooth device **driver** responsible for software-instrument communication, as well as select instrument from *Instruments List* for connection.

Use one of the following ways* to open *Instruments List*:



*Press this toolbar button;



*Select *File* menu and click *Instruments List* command;

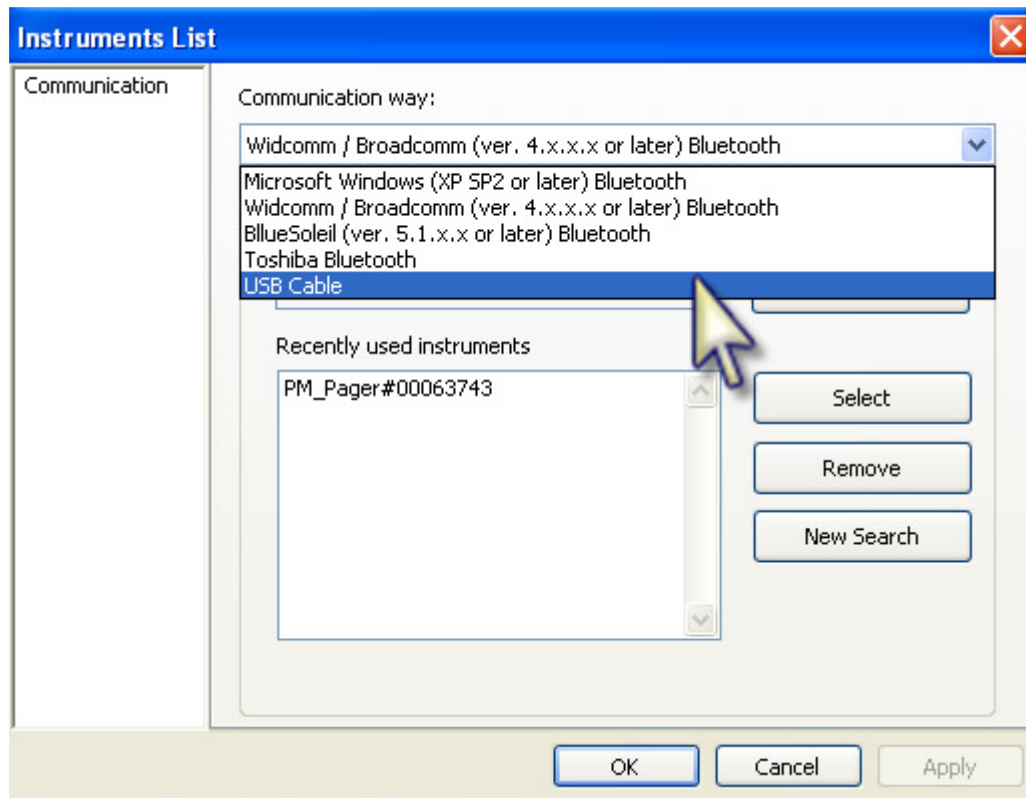


If *Instruments List* command is clicked when instrument communicates with software, software breaks communication and becomes available for communication settings configuration.

If user closes *Instruments List* window, then software either restores communication with the instrument (if no communication settings were configured), or communicates with the instrument under new settings (if any communication settings were configured).

COMMUNICATION SETTINGS

Communication Tab

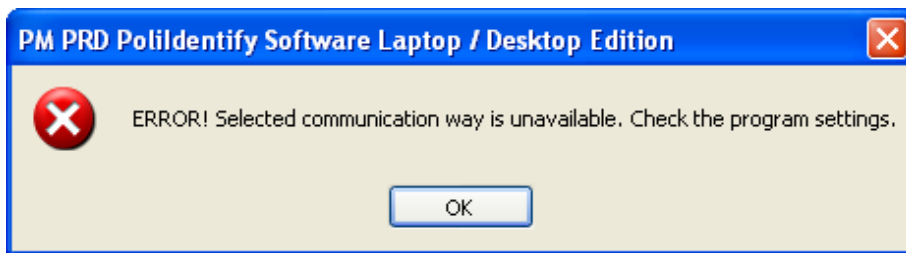


➤ **USB Cable** — choose this option in the drop-down list if software will communicate with the instrument by USB interface;

➤ **Bluetooth**¹ — choose required **Bluetooth** option (**driver version**) in the drop-down list if software will communicate with the instrument by **Bluetooth** interface;

Error message will be displayed if current software version or instrument doesn't support selected driver version:

¹ Software installed on PC under 64-bit OS (Microsoft Windows XP 64, Microsoft Windows Vista 64) doesn't support Widcomm driver.



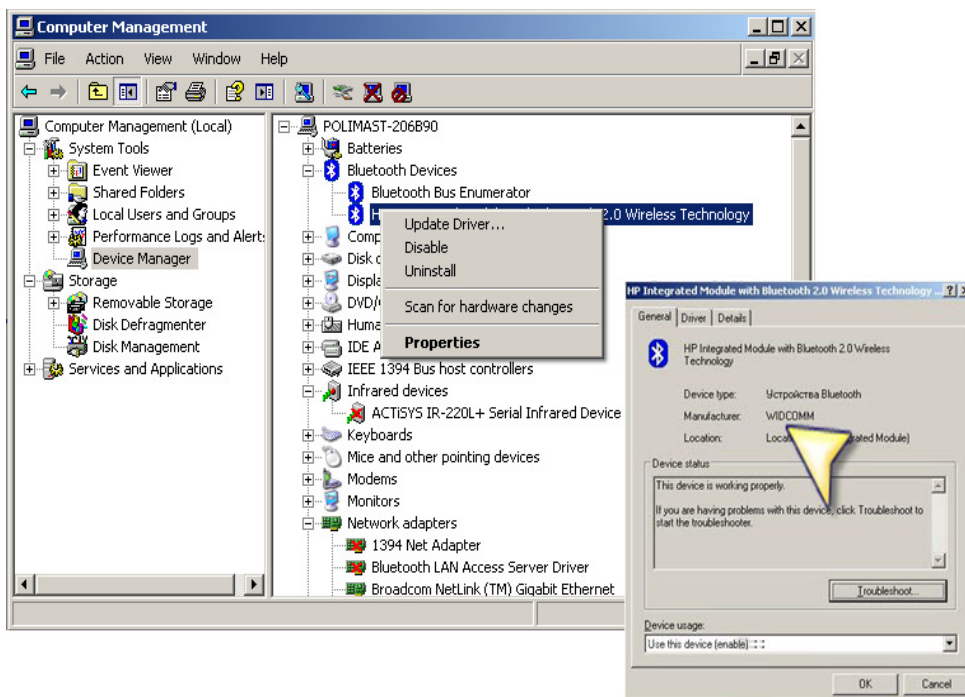
Manufacturer name and **Bluetooth driver version** can be defined as follows:

— refer to **Bluetooth adapter** operation manual,

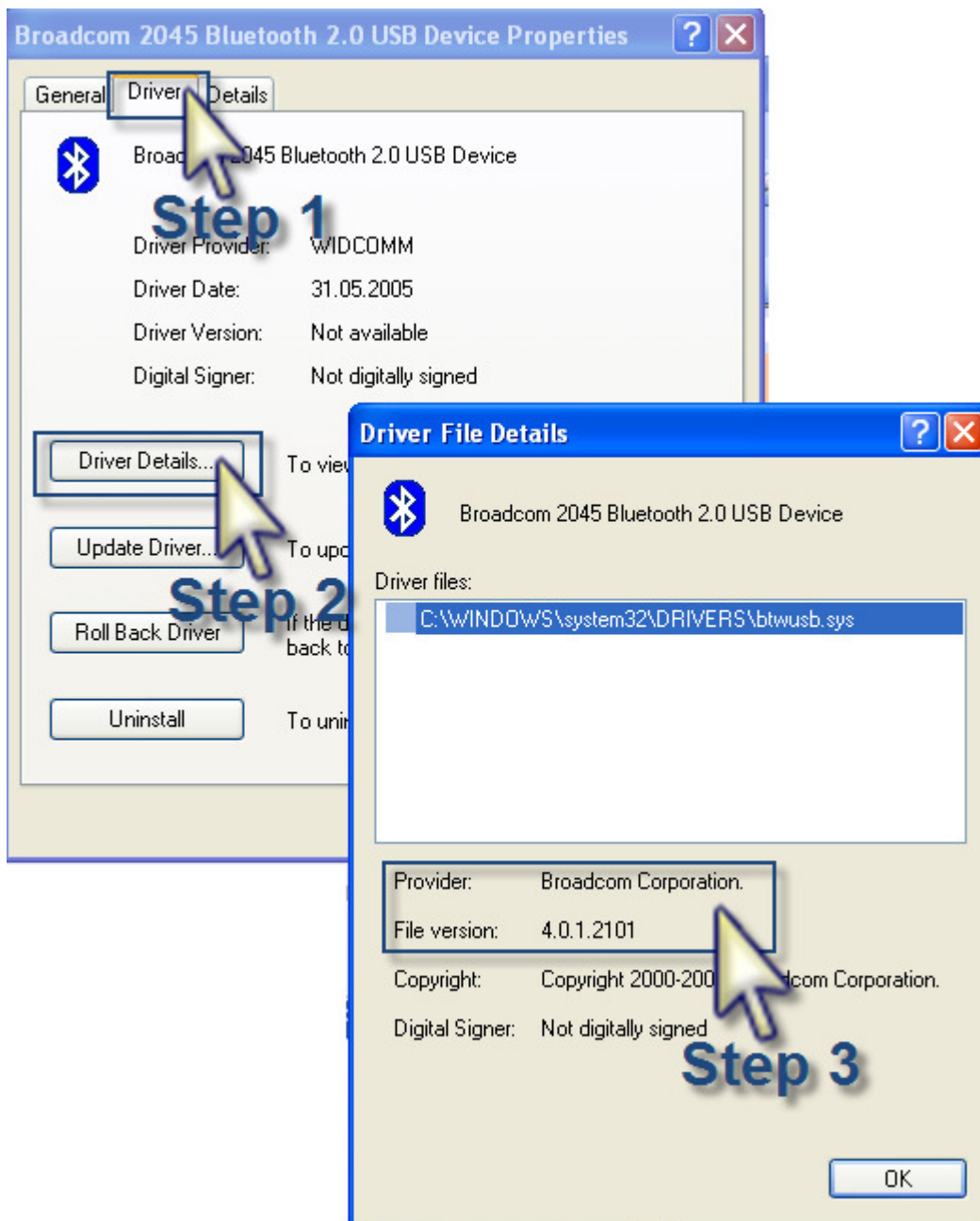
or

— refer to properties of installed **Bluetooth** adapter. You can check Bluetooth driver version in **Device Manager (Start > My Computer (right mouse-click) > Computer Management > Device Manager)**. Select **Bluetooth** option. Select **Properties** by right mouse-click.

Manufacturer name:



Bluetooth driver version:



**Attention!**

Bluetooth driver version must be the same or higher as stated in program settings:

- Microsoft Windows XP (**SP2 or higher**);
- Widcomm or Broadcom (**4.x.x.x or higher**),
- IVT Corporation (BlueSoleil) (**5.1.x.x or higher**).

If not, please download the most recent driver version from Bluetooth manufacturer's website:

- Microsoft (Windows XP SP2, Windows Vista) – <http://support.microsoft.com/kb/841803/en-us>
- Widcomm\Boardcomm – <http://broadcom.com/products/Bluetooth>
- IVT Corporation (BlueSoleil) – <http://bluesoleil.com>

If you still fail to set Bluetooth adapter, call you system administrator.

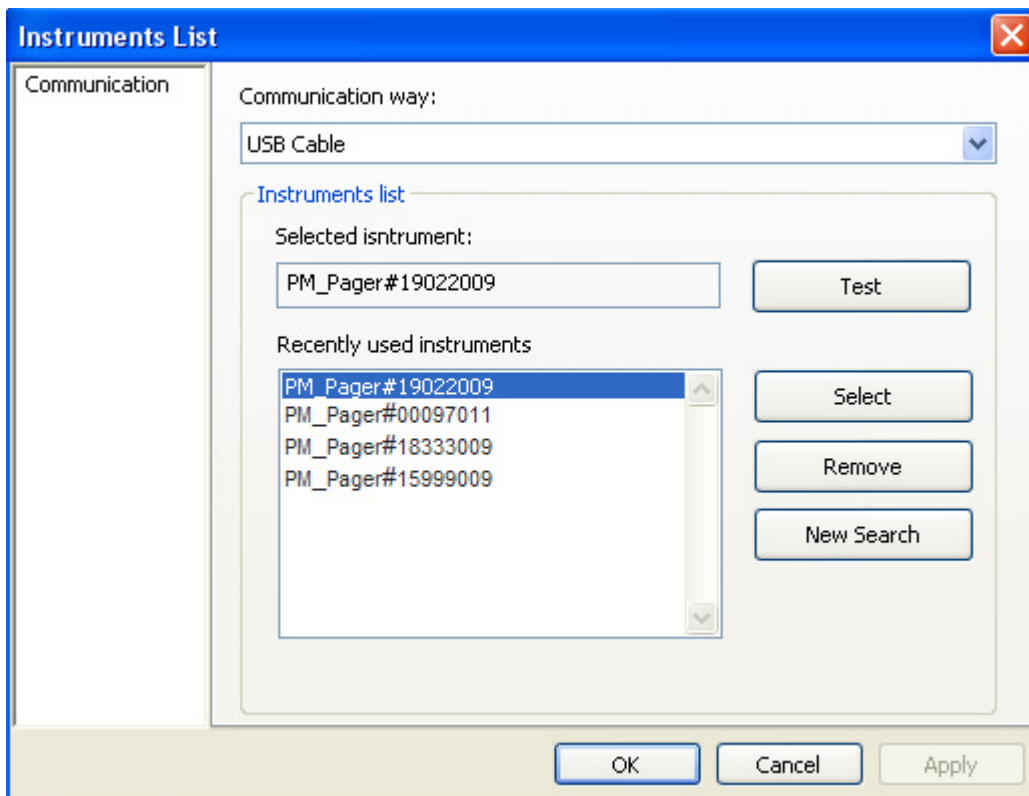
Press **OK** to save changes.

CREATE INSTRUMENTS LIST

Instruments list represents list of instruments' serial numbers that have ever communicated with software.

Software generates *Instruments List* for every communication type separately. Hence, when PC operator switches between communication ways, software automatically loads *Instruments List* that was generated for selected communication type.

At first program start there is no *Instruments List* to be displayed.



➤ **Test** — press to check software-instrument communication process. Serial number of the connected instrument is displayed in the *Selected Instrument* field (see [Connect Instrument](#)).

➤ **Select** — press to select instrument for communication in the *Recently used instruments* field. Doing so its serial number will be displayed in the *Selected Instrument* field (see [Connect Instrument](#)).

➤ **Remove** – press to delete instrument serial number from the *Instruments List*. **The instrument will be deleted from program database IRREVERSIBLY!**

➤ **New Search** — press to start new search of the instrument by selected communication way. Instrument serial number will be displayed in the *Found Instruments* window. (see [Connect Instrument](#)).

PRE-CONNECTION PROCEDURE



Attention!

Software enables communication with only one instrument at a time.



Attention!

Prior to soft connection to the instrument, be sure that all the requirements stated in the **Recommended Initial Procedure** chapter are fulfilled.

In particular:

1. The instrument must be switched on (see Operation Manual on the instrument);

For instruments with Bluetooth-interface¹:

2. Bluetooth-communication in the instrument (see Operation Manual on the instrument) and PC must be initialized;
3. The instrument is located within the radio-channel coverage area;
4. Test instrument-PC communication by Bluetooth protocol according to the **Test Instrument-PC Communication by Bluetooth Protocol** chapter.

For instruments with USB-interface¹:

5. The instrument is connected to PC by miniUSB-USB cable (supplied with the instrument) according to Operation Manual on the instrument.

¹ See instrument-supported interface type in the Operation Manual on the instrument.

INITIALIZE BLUETOOTH-COMMUNICATION IN INSTRUMENT

For instruments with Bluetooth - interface¹



Note!

Initialize Bluetooth module according to Operation Manual on the instrument.

TEST INSTRUMENT-PC COMMUNICATION BY BLUETOOTH PROTOCOL

Polimaster recommends testing instrument-PC communication by Bluetooth protocol prior to enabling instrument-software communication. (Be sure that Bluetooth-module in the instrument is activated).

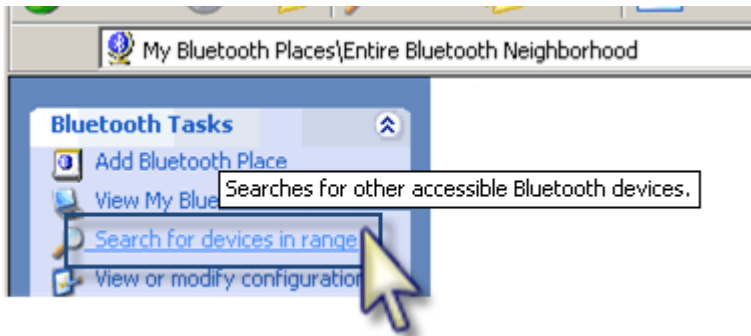
Step 1

Open *My Bluetooth Places* window. To open the window: use left field of *Windows Explorer* or right-click the Bluetooth icon on the **Windows Task Manager** tray. Click *My Bluetooth Places Properties* in the opened context menu.

¹ Instrument-supported interface type is stated in the Operation Manual on the instrument.

Step 2

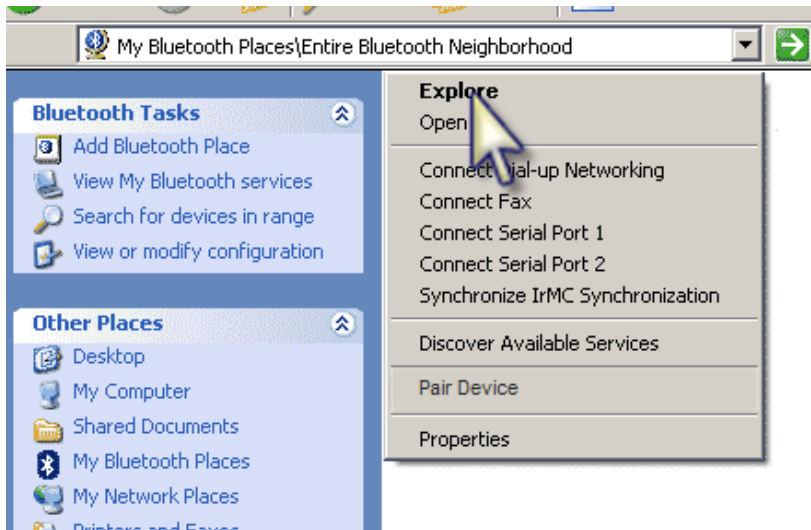
Click *Search for devices in range* command.



System will take some time to search for all devices available for connection by Bluetooth protocol. Then all found devices will be displayed in *My Bluetooth Places/Entire Bluetooth Neighborhood* window.

Step 3

Double mouse click required instrument icon to open PC-instrument remote connection settings window. You can as well click *Explore* command from the context menu to open this window.



Step 4



Double mouse click icon with instrument serial number to start procedure of virtual connection to remote instrument by serial port.



Attention!

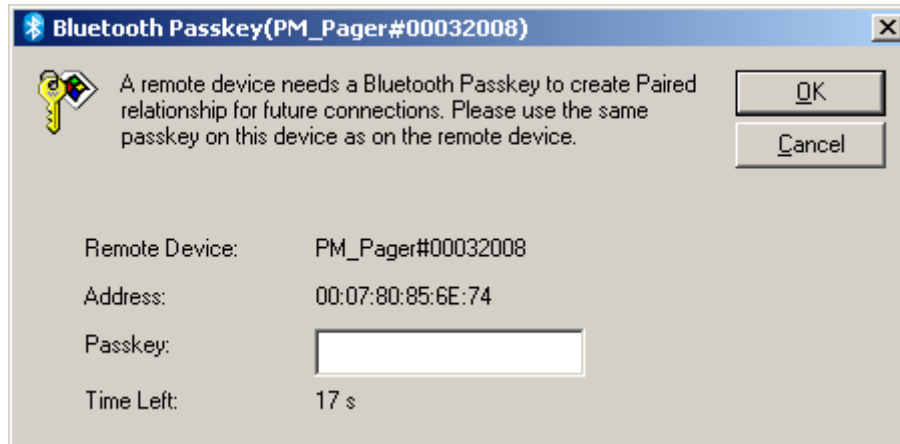
If **Secured connection** option is enabled on any instrument, the Bluetooth device will ask for PIN-code or Passkey while connection setup attempt with the instrument. Default PIN-code is **5555**. Hence the system will ask for Bluetooth connection procedure to create Paired connection.

We suggest two ways to solve this problem:

1. Enter required PIN-code to fulfill the procedure. Default PIN-code is **"5555"** (see Step 4.1).
2. Disable Secure connection function (see Step 4.2).

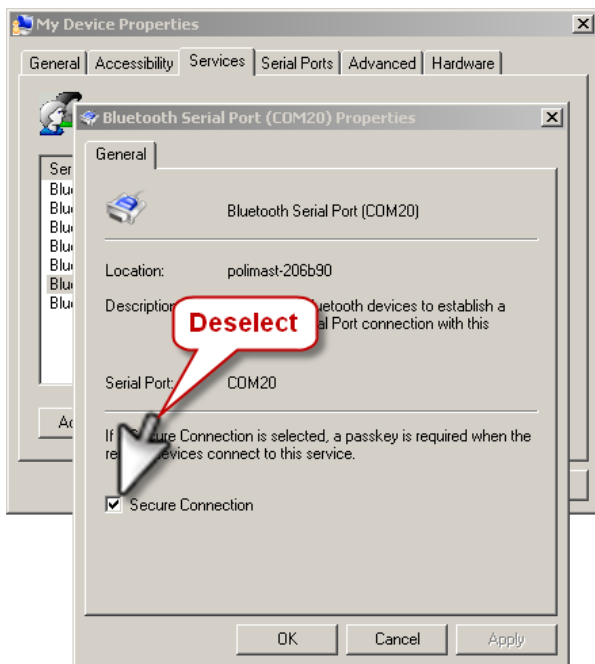
Step 4.1 Bluetooth-Pairing Procedure

The authentication process, i.e. PIN-code exchange is a property of the **Secure connection** function. If PIN-code exchange is successful during the initial connection, “coupled pair” or “coupled connection” will be created. Further connection inside “coupled pair” doesn’t require authentication process. **Default PIN-code is 5555.**



Step 4.2 Switch Off Secure Connection Function

To switch off the **Secure connection** function in the Bluetooth device, right-click on the **Bluetooth** icon on the Windows system tray. Select additional settings option. Go to **Services** and **Bluetooth Serial Port Properties** to switch off the **Secure connection** function by unflagging the **Bluetooth serial port** check-box.

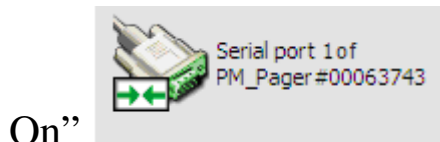


If the system still asks for PIN-code after switching off the **Secure connection** function in the **Bluetooth** device, the inquiry source can be in the very instrument. If so, enter PIN-code of the instrument. Default PIN-code is 5555.

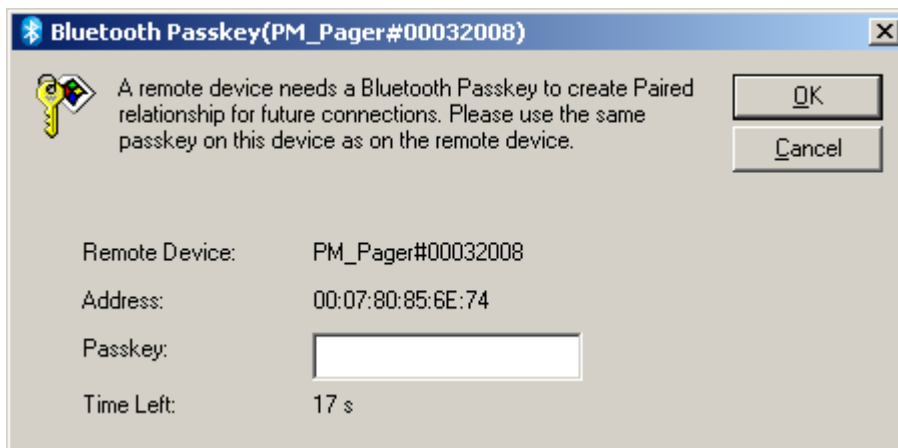
Step 5

When software communicates with the remote instrument by serial port, corresponding message appears.

If connection is successful, serial port icon status will change for “Switched

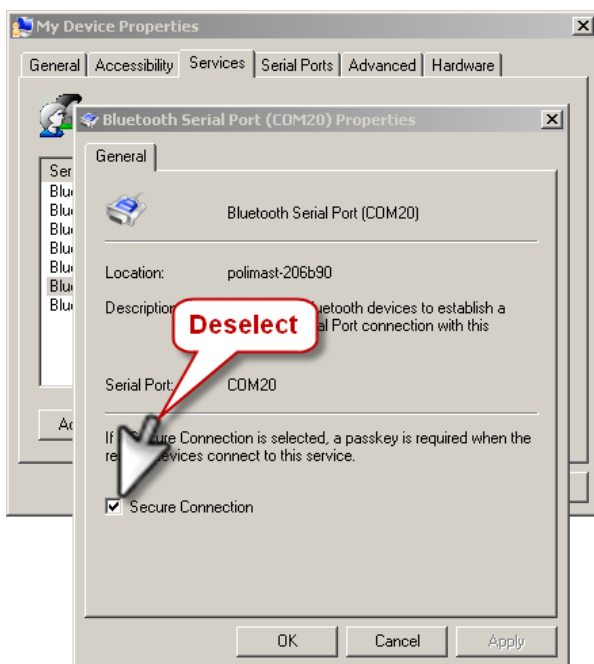


If **Secured connection** option is enabled on any instrument, the Bluetooth device will ask for PIN-code or Passkey while connection setup attempt with the instrument. Default PIN-code is **5555**.



The authentication process, i.e. PIN-code exchange is a property of the **Secure connection** function. If PIN-code exchange is successful during the initial connection, “coupled pair” or “coupled connection” will be created. Further connection inside “coupled pair” doesn’t require authentication process.

To switch off the **Secure connection** function in the Bluetooth device, right-click on the **Bluetooth** icon on the Windows system tray. Press **My Device Properties** in the context menu. Go to **Services** and switch off the **Secure connection** function in application properties window by unflagging the **Bluetooth serial port** check-box.



If the system still asks for PIN-code after switching off the **Secure connection** function in the **Bluetooth** device, the inquiry source can be in the very instrument. If so, enter PIN-code of the instrument. Default PIN-code is **5555**.

SOFTWARE-INSTRUMENT CONNECTION PROCEDURE

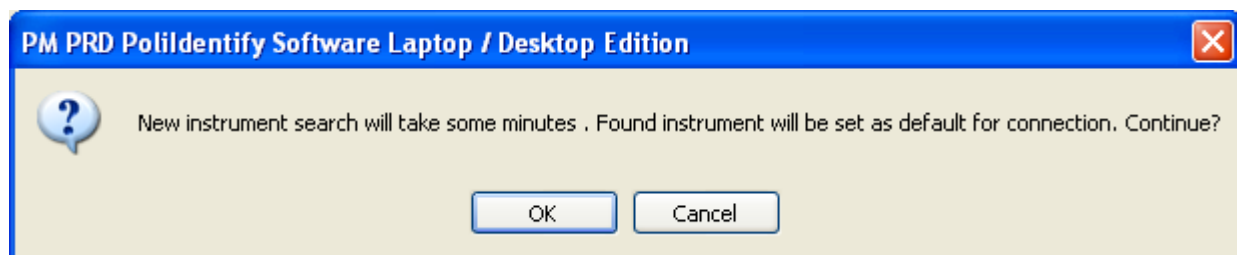
To enable PC-instrument software connection: open *Instruments List* window. Connection procedure sequence depends on the instrument communication status (whether it is new instrument or instrument from Instruments List):

Be sure to meet all the requirements of **Recommended Initial Procedure** chapter prior to enable instrument communication with the program.

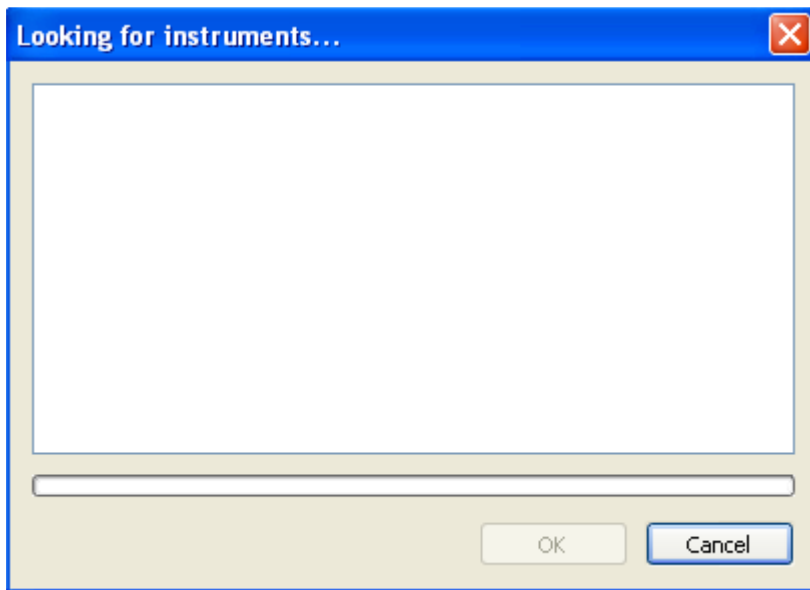
Software-instrument connection procedure	
For new instrument:	For instruments from <i>Instruments List</i>:
1. Search for a new instrument;	1. Select instrument from <i>Instruments List</i> ;
2. Add new instrument into <i>Instruments List</i> ;	
3. Test communication with the added instrument;	
4. Connect instrument.	2. Connect instrument.

SEARCH/ADD INSTRUMENT INTO INSTRUMENTS LIST

To add new instrument into the *Instruments List*: click *New Search* button in the *Instruments List* window. Program will ask for confirmation:



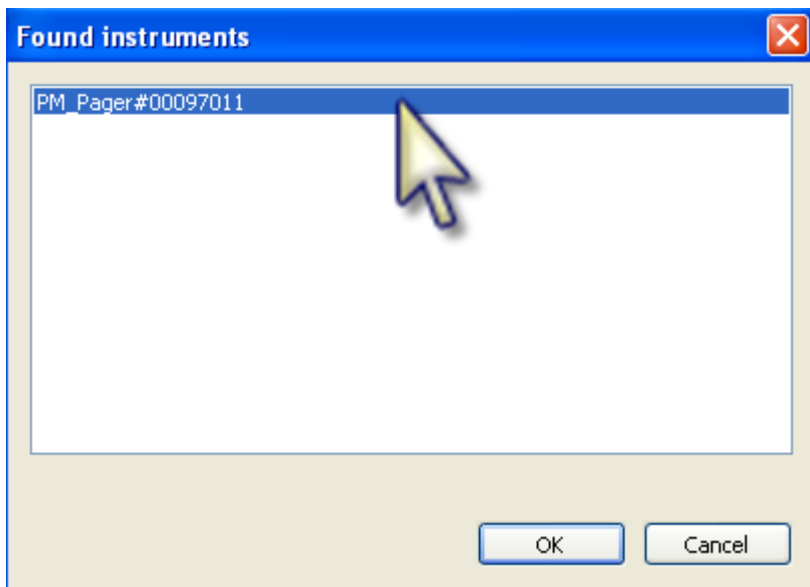
Program starts searching instrument available for connection by set communication type. Search process is accompanied by active graphic progress bar.



If instrument search fails and error message is displayed, check PC-instrument connection, whether:

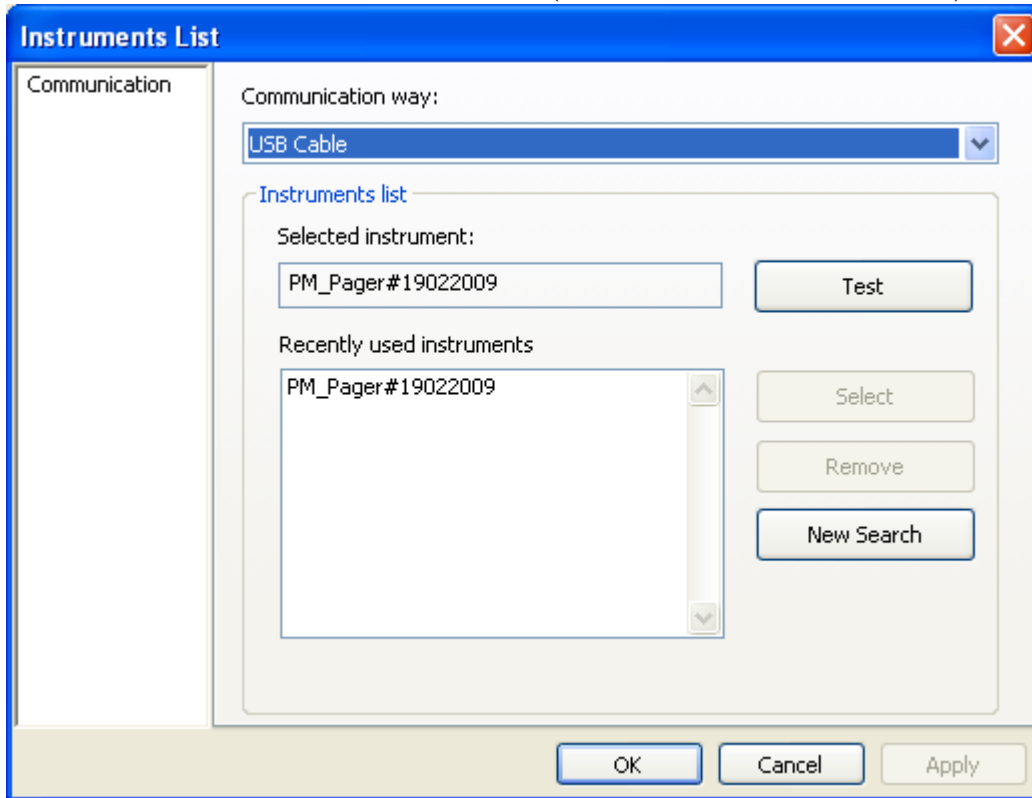
- instrument and PC settings of **Bluetooth module** are correct and module is switched ON;
- instrument is connected to PC by **USB-cable**;
- required **Communication way** is selected in the program settings.

Successful search displays serial number of the found instrument in the window.



To add selected instrument to the *Instruments List*: left mouse-click its name and press **OK**.

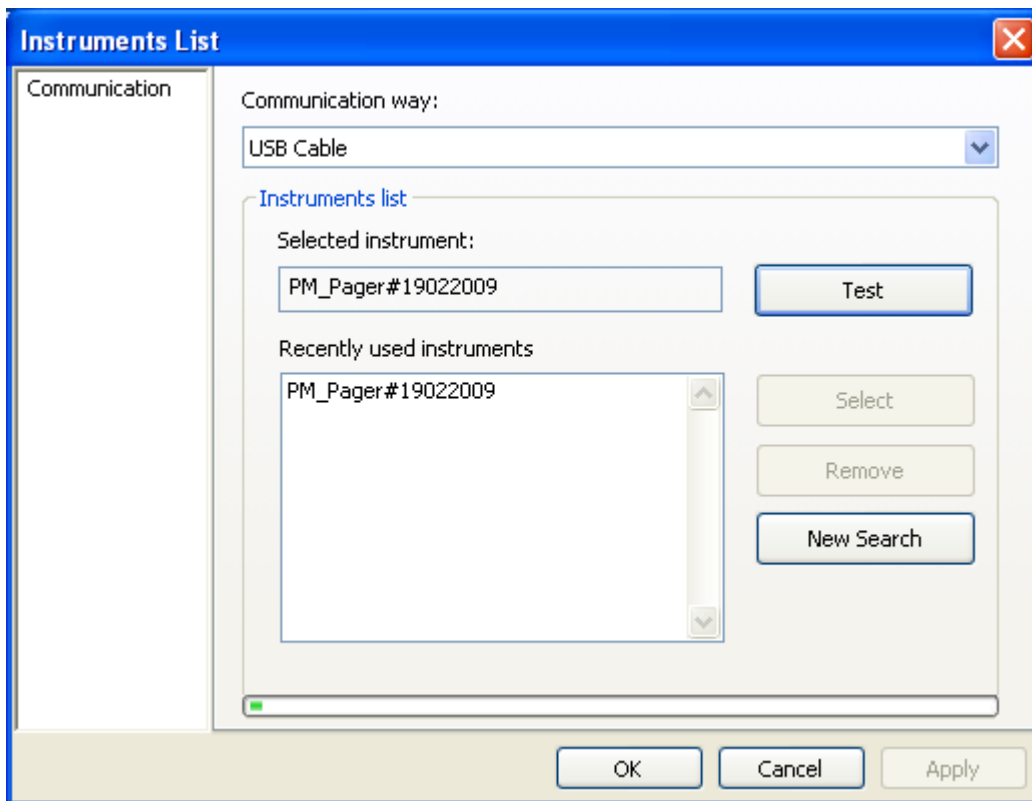
Software automatically records found instrument into *Instruments List* (**Recently used instruments** field), as well as sets found instrument as intended for PC communication, and populates **Selected instrument** field with its serial number. It is done to enable future communication with the instrument (see **Connect Instrument**).



TEST PC-INSTRUMENT COMMUNICATION

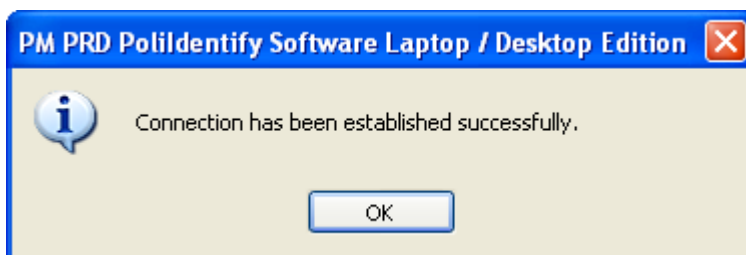
If the instrument is connected to PC for the first time (there is no its serial number in the *Instruments List*): first of all add new instrument into the *Instruments List* (see **Add New Instrument**).

Program automatically puts found instrument into *Instruments List* (**Recently used instruments** field) as well as sets it as a default instrument for PC communication and populates **Selected instrument** field with its serial number. Press **Test** to check communication with new instrument.



Testing process is accompanied by active graphic progress bar.

Successful communication test displays corresponding message:



Press **OK** to close window. Press **OK** to exit *Instruments List* window to save settings and continue connecting procedure.

SELECT INSTRUMENT FROM INSTRUMENTS LIST

Software generates separate *Instruments List* for every communication way. Thus, when switching between communication ways, software automatically loads *Instruments list* generated for selected way.

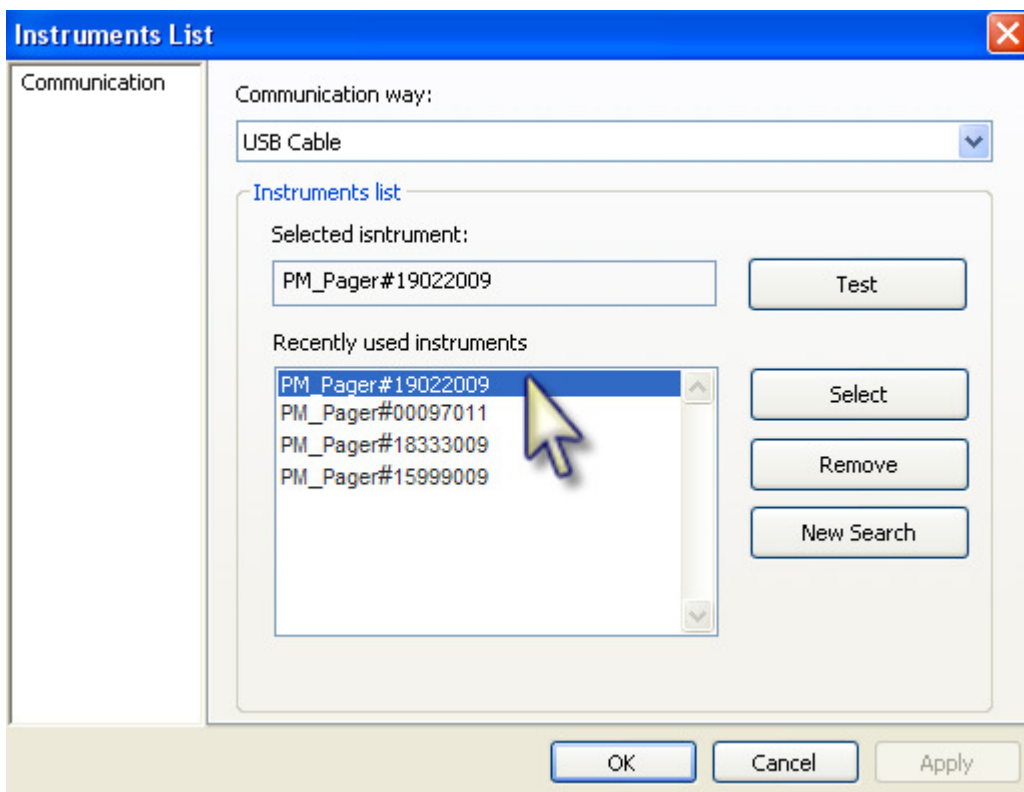
If instrument is already in the *Instruments List*, its serial number will be displayed in the:

- **Selected instrument** field (if it's the last instrument that has been software-communicated).

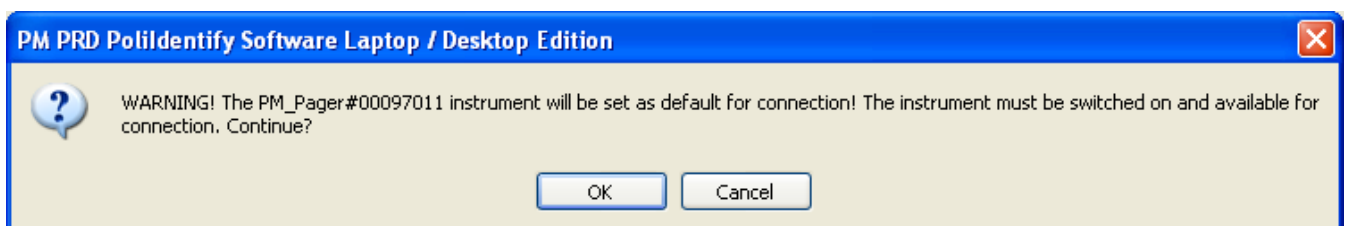
PC operator skips procedure of instrument selection from *Instruments List* and immediately tests and establishes connection with the instrument.

- **Recently used instruments** field (list of 10-20 instruments that have recently communicated with software). If any instrument from *Instruments List* is required for communication: first select it from the list, and then program populates **Selected instrument** field with its serial number.

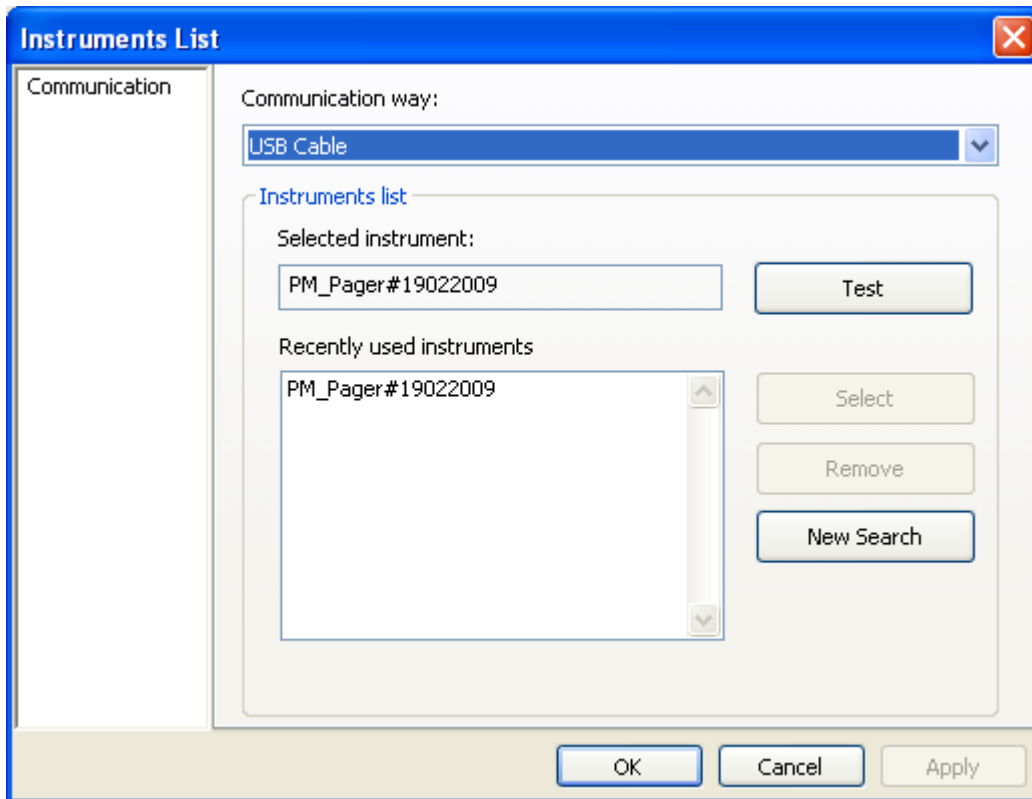
To select instrument for communication from *Instruments List*: left click serial number of the required instrument in the **Recently used instruments** field, and press **Select**.



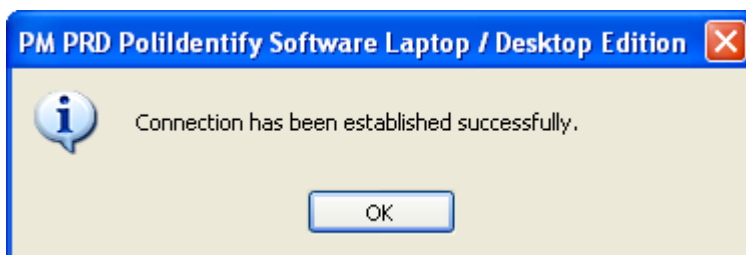
Software asks for confirmation. Press **OK** to confirm.



Connection process is accompanied by active graphic progress bar.



If software establishes successful communication with the instrument, the following window is displayed:



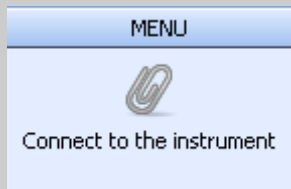
Press **OK** to close this window. Press **OK** to exit *Instruments List* window to save settings and continue connection procedure.

CONNECT INSTRUMENT

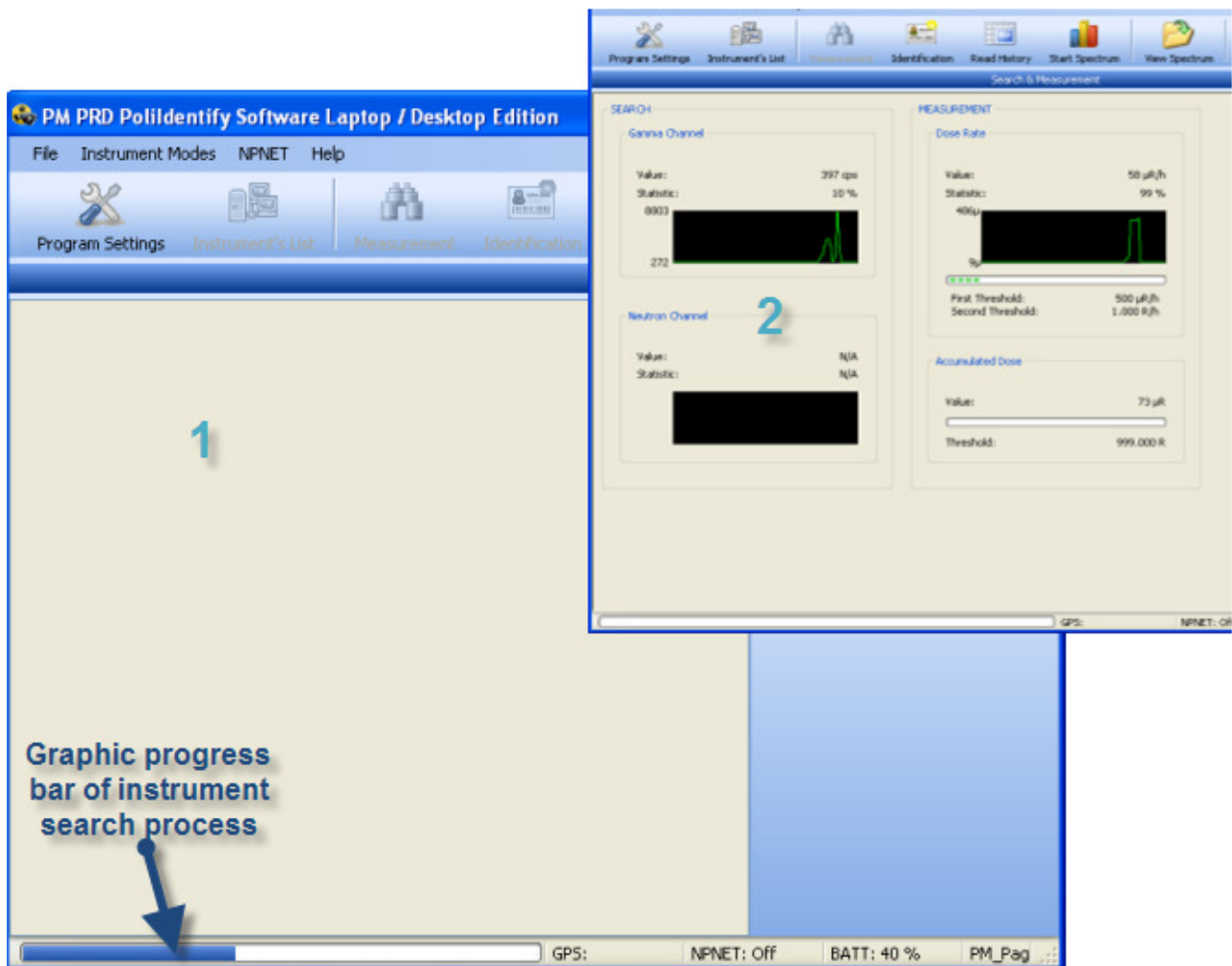
Software closes program settings window and automatically initiates instrument connection process. The process is accompanied by graphic progress bar (1) in the main program window.



If software doesn't start connection automatically (i.e. no active progress bar is graphically displayed in the main program window), start it manually. To do it: click *Connect to the instrument* command in the right panel of the main program window.



Upon successful connection main program window information field will display *Search & Measurement* mode window (2).



"PM PRD PoliIdentify Software Laptop/Desktop Edition" takes control over connected instrument.

OPERATION MODES



Read *Operation Manual* on the instrument before doing it.

- **Search & Measurement mode**
 - *Search Gamma Channel/Neutron Channel* sub-mode;
 - *Gamma measurement (indication of DER, DE)* sub-mode;
 - *Calibration (available in the Search & Measurement)* sub-mode.
- **Isotopes Identification mode;**
- **Read History mode;**
- **Start Spectrum mode;**
- **View Spectrum mode;**
- **Instrument Settings mode;**
- **Send to NPNET mode**



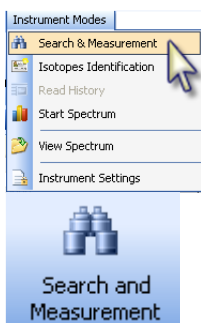
Attention!

Take into account that the current Guide describes communication of “PM PRD PoliIdentify Software Laptop/Desktop Edition” with gamma-, as well as gamma-neutron detectors. Nevertheless, further this Guide contains screenshots of software operation with gamma-neutron detectors only.

SEARCH & MEASUREMENT MODE

Software automatically enters **Search & Measurement** mode at first connection to the instrument.

Use one of the following ways* to switch from any mode to **Search & Measurement** mode:

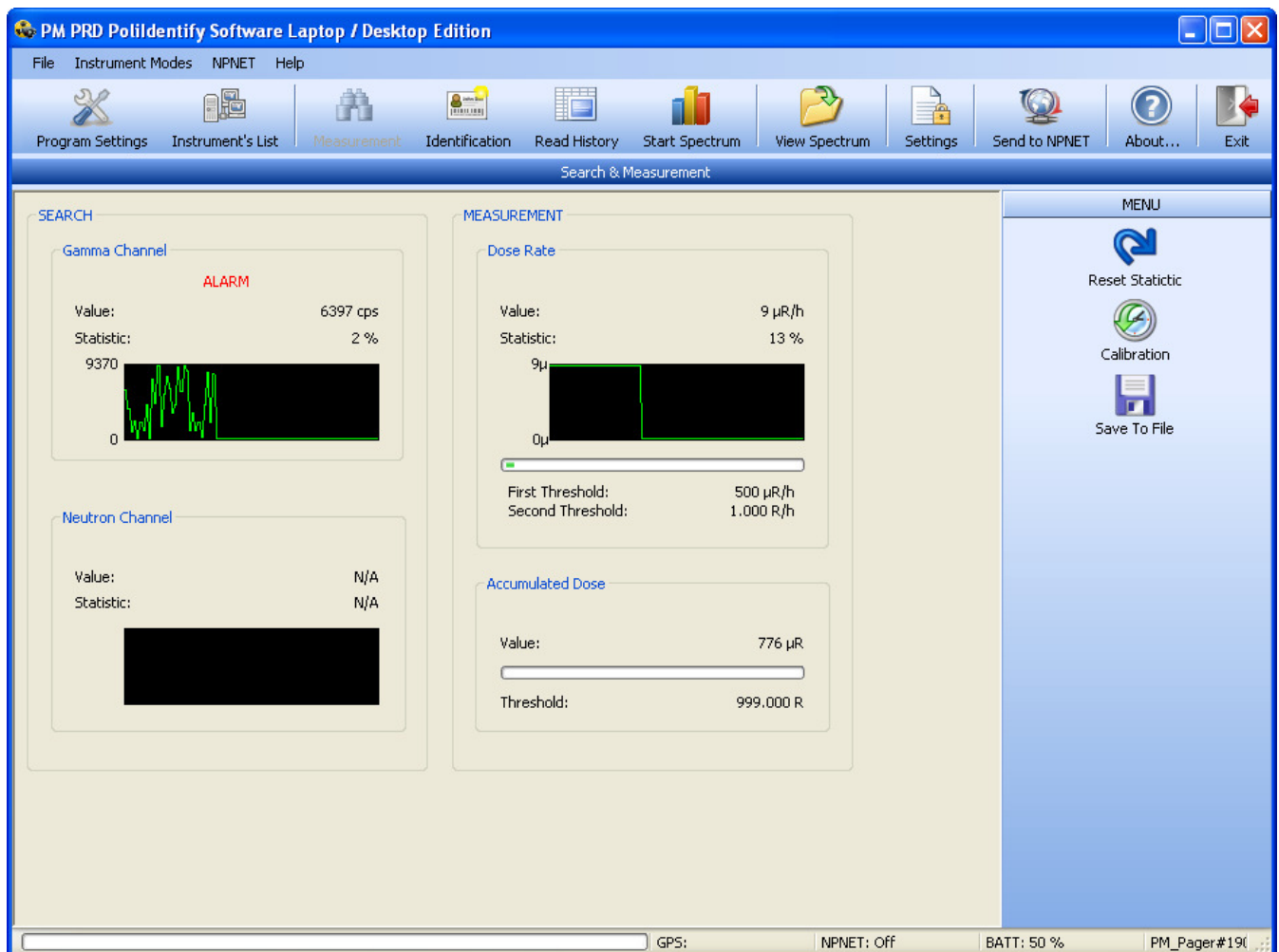


*Select *Instrument Modes* menu and click *Search & Measurement* command.

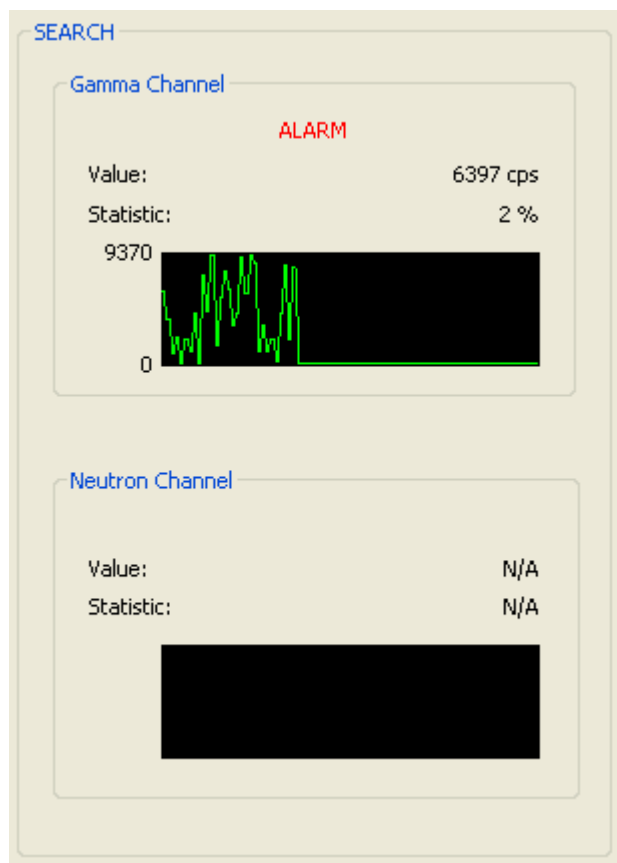
*Press this toolbar button

Successful connection displays *Search & Measurement* mode sub-modes in the main program window information field:

- **Search Gamma Channel/Neutron Channel** sub-mode;
- **Measurement Dose Rate/Accumulated Dose (DER, DE indication)** sub-mode;
- **Calibration** sub-mode (available in *Search & Measurement* mode).



SEARCH GAMMA CHANNEL/NEUTRON CHANNEL SUB-MODE



Current average count rate of impulses from SDB (scintillation detecting block) and NDB (neutron detecting block) is calculated in the **Search Gamma Channel/Neutron Channel** sub-mode.

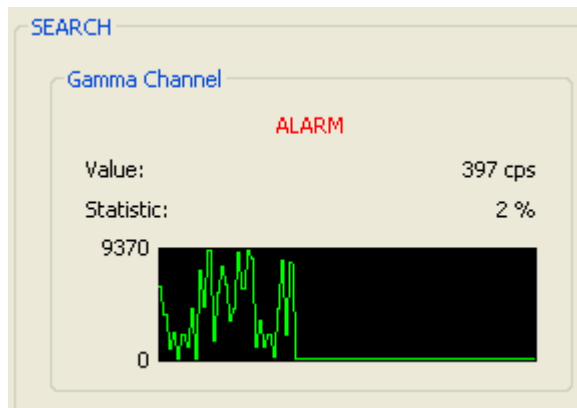
Calculated average count rate value is displayed in two ways:

- ➔ **digitally** – in impulses per second (cps) for gamma channel in the upper screen area, and in the lower screen area – for neutron channel¹.
Relative mean square deviation of the average count rate value (statistical error) is displayed for each channel in percents. The confidence coefficient is 0.95.
- ➔ **graphically** – graphical display of Search sub-mode represents the most convenient way for user to watch changing average count rates of corresponding channel. The graph is being scaled automatically. Polimaster recommends using this way during localization of ionizing radiation sources.

¹ If software communicates with the gamma detector, there will be no neutron search mode indication area displayed.

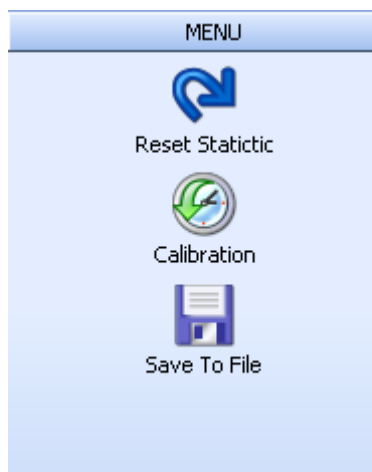
Current count rate value is compared to **alarm threshold** calculated in the *Calibration* sub-mode.

If the current count rate exceeds the threshold value for any channel, the **ALARM** message will be immediately displayed.



Alarm threshold can be changed by setting new **n coefficients** for gamma- and neutron channels correspondingly in *Instrument Modes > Instrument Settings mode > Thresholds* tab (see [Instrument Settings](#) chapter).

SEARCH & MEASUREMENT SUB-MODE MENU



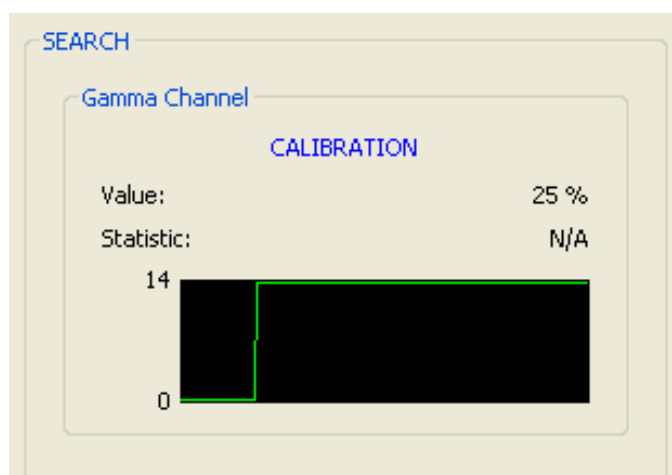
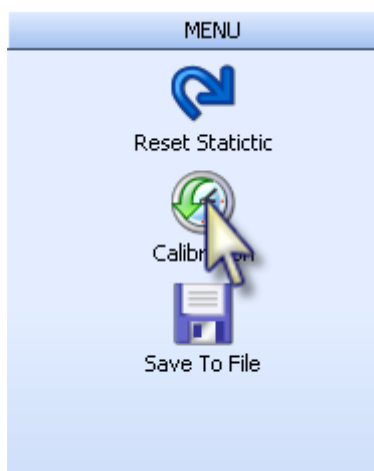
➤ **Reset Statistic** - the averaging process of count rate begins again.

➤ **Calibration** - instrument automatically enters *Calibration* sub-mode, and then returns to *Search Gamma Channel/Neutron Channel* mode.

➡ **Save to File** – save current dose value of Measurement sub-mode and geographical coordinates from GPS module¹ into file. File path is set in the *GPS* tab of the *Program Settings*.

CALIBRATION SUB-MODE

To switch instrument to *Calibration* sub-mode, press *Calibration* in the dynamic menu of *Search & Measurement* mode.



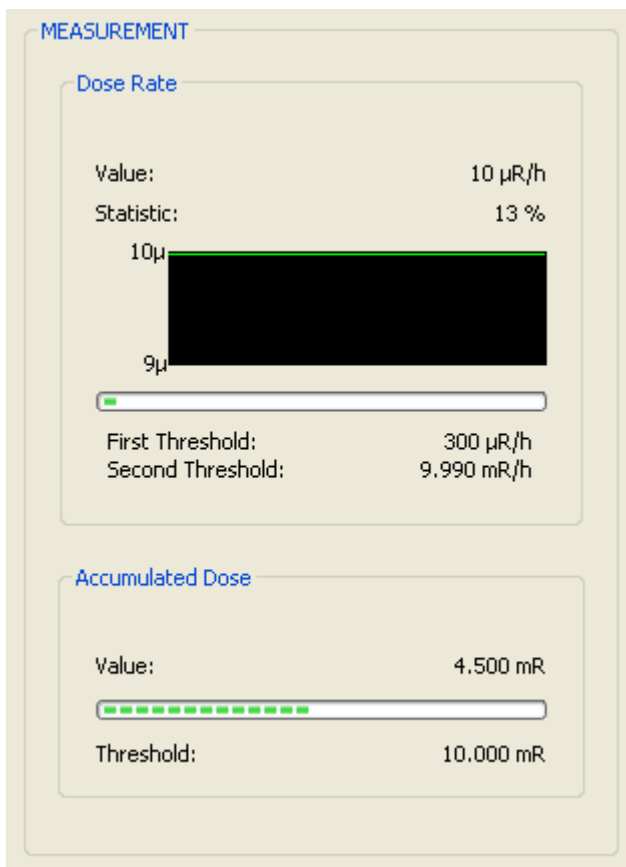
Instrument measures gamma- and neutron emission background in the *Calibration* sub-mode. At that quantity of impulses coming from SDB and NDB is calculated. Then instrument calculates average impulses count rate per second during calibration time, and, according to fixed number of square deviations, calculates **alarm threshold** values by gamma and neutron channels separately (further – **n-coefficients**).

Calculated values are recorded to the instrument upon calibration completion, and program displays *Search Gamma Channel/Neutron Channel* mode.

¹ Geographical coordinates may be not available if:

- GPS module is currently inside the building,
- if GPS module is in the open country thought shadowed of huge objects or buildings,
- if GPS receiver gets signals from less that three satellites.

MEASUREMENT SUB-MODE



In the *Measurement Dose Rate/Accumulated Dose* sub-mode of photon emission the following is indicated in corresponding fields:

Dose Rate field:

- Measured value of dose equivalent rate (further - DER) в $\mu\text{Sv/h}$, mSv/h exposure dose rate in $\mu\text{R/h}$, mR/h or R/h (state measurement units when purchasing instrument);
- Statistic error of average measured DER value in percents;
- Graphic display of *Dose Rate* sub-mode. The graph is being zoomed automatically;
- Dynamic progress bar of set DER accumulation level (**First Threshold/Second Threshold**)¹;
- **First Threshold (Second Threshold)**¹ — fixed DER threshold or security threshold (in mR/h (mSv/h)). Threshold setting range corresponds to DER measurement range stated in the instrument Operation Manual. Fixed **DER/DER2 threshold** of *Measurement* sub-mode can be changed in *Instrument Modes* > *Instrument Settings* > *Thresholds* tab (see **Instrument Settings** chapter).

¹ Two-level control for DER and DE threshold are available for PM1703MO-1B, PM1703MO-1A instruments only.

Accumulated Dose field¹:

- Measured value of dose equivalent rate (further - DER) в μSv , mSv exposure dose rate in μR , mR or R (state measurement units when purchasing instrument);
- Statistic error of average measured DE value in percents;
- **Threshold – dose threshold (in mR (mSv))**. Threshold setting range corresponds to DE measurement range stated in the instrument Operation Manual. Fixed **dose threshold** of *Measurement* sub-mode can be changed in *Instrument Modes* > *Instrument Settings* > *Thresholds* tab (see **Instrument Settings** chapter).

To reset accumulated equivalent dose value from instrument non-volatile memory: select *Instrument Modes* menu and click *Instrument Settings* > *General* (see **Instrument Settings** chapter). Program will ask for confirmation.



Attention!

Accumulated DE values are deleted from instrument memory irreversibly. After that the accumulation process is started anew.

¹ For PM1703MO-1B, PM1703MO-1A instruments only;

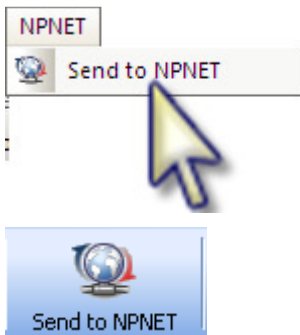
SEND MEASUREMENT DATA TO NPNET INFORMATION SYSTEM



Note!

Transfer of current geotagged measured DER value in *Measurement* sub-mode requires GPS module (external (USB) or internal) connected to a PC. This function should be activated in **Program Settings**.

Use one of the following ways* to transfer current **measured geotagged DER values** to NPNET system:



* Select *NPNET* menu and click *Send to NPNET* command;

* Press this toolbar button;

The following information will be transferred to web-server:

- Current measured DER value;
- Geographic coordinates (latitude/longitude) received from the PC-connected GPS module¹;
- Current date/time.

¹ Geographical coordinates may not be available if:

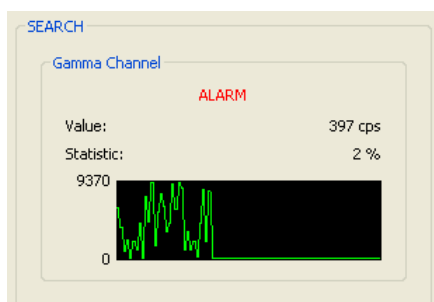
- GPS module is currently inside a building,
- GPS module is in the open country though shadowed of huge objects or buildings,
- GPS receiver gets signals from less than three satellites

ISOTOPES IDENTIFICATION MODE

The instrument in this mode conducts quick identification of radionuclide composition of material on the basis of gamma scintillation spectrum being accumulated at the moment. Gamma-channel loading during the spectrum accumulation is an important requirement for reliable results. Under- or over-loading of gamma channel distorts it and, as sequence, leads to insufficient reliability.

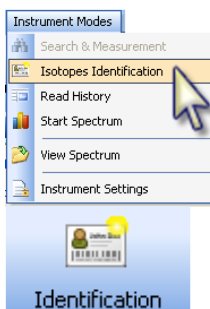
The manufacturer recommends checking of gamma channel loading in the *Search & Measurement* mode before switching the instrument into *Isotopes Identification* mode.

The average count rate of the registered photon radiation impulses and the average count rate statistical error by scintillation detection block (SDB) are displayed in the **Gamma Channel** field of *Search & Measurement* mode. Place the instrument at such a distance to the tested object so that count rate by SDB is in the range between 300 and 400 cps.



Switch the instrument into the *Isotopes Identification* mode when the gamma channel is loaded as needed.

Use one of the following ways* to start *Identification* of matter radionuclide composition by current accumulated gamma emission spectrum:

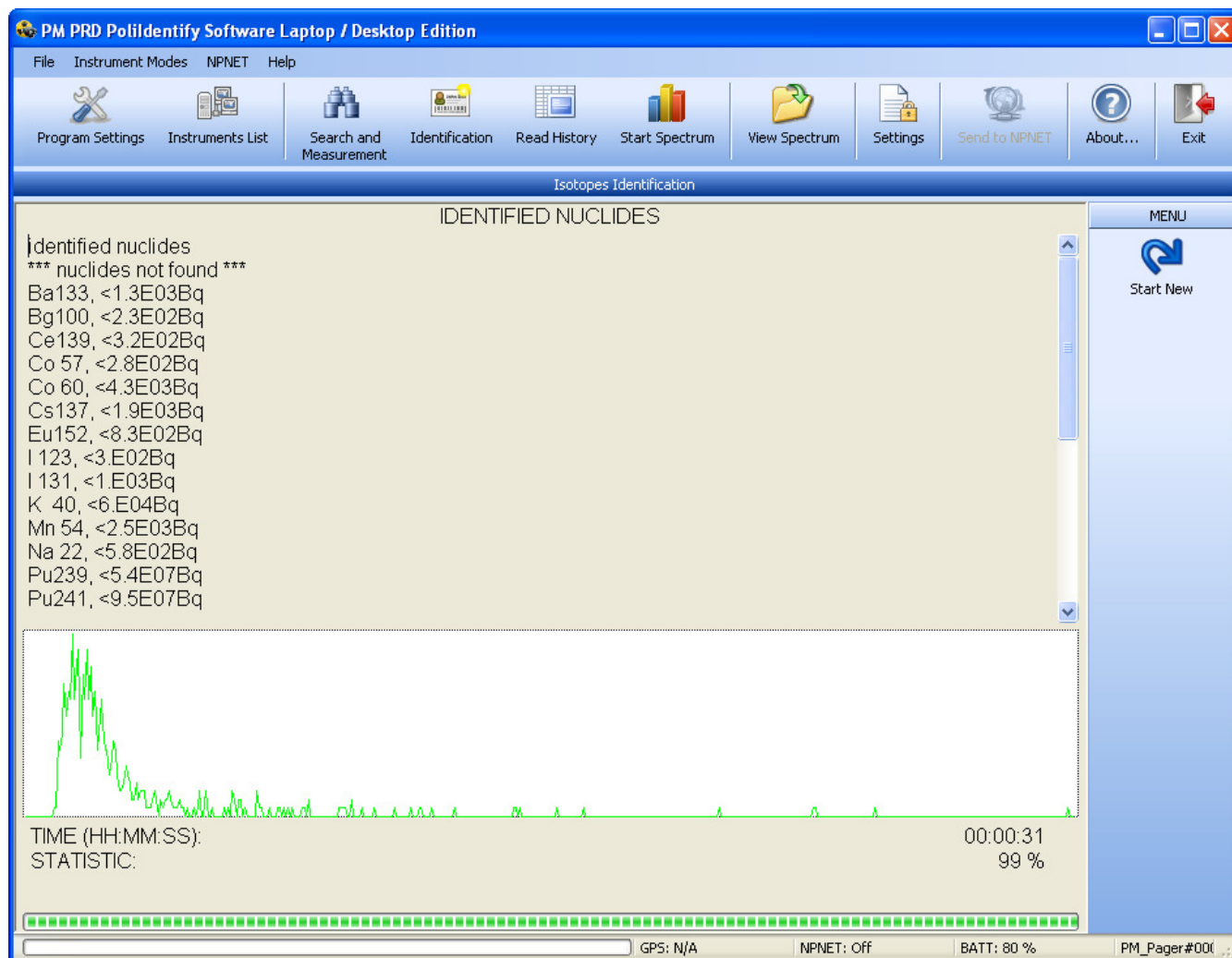


*Select *Instrument Modes* menu and click *Isotopes Identification* command.

*Press this toolbar button.

When waiting period is over (several seconds), the progressive graph of the spectrum being accumulated will be displayed in the center of information window.

When the *Time* progress bar is filled completely, identification time (value is software-counted) is over. As a result, identified radionuclides should be named in the upper field: **Identified Nuclides**.



Identification is going within the area that is set in the isotope library (list of all the isotopes of the library). Isotope library is selected from the recorded libraries list in **Program Settings (General tab)**. By default *Lib_ful.lib* library with full isotopes list is activated.

See Appendix A with explanations.

ISOTOPES IDENTIFICATION MODE MENU

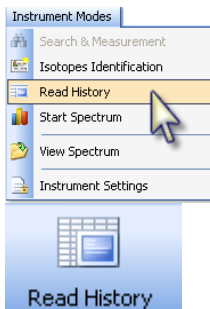


➡ **Start New** – the process of count rate averaging is restarted, and, hence, the *Isotopes Identification* mode is started.

READ HISTORY MODE

In this mode user can read instrument data and view operation history recorded in its non-volatile memory.

Use one of the following ways* to read instrument history:



* Select **Instrument Modes** menu and click **Read History** command;

*Press this toolbar button.

The program will take some time to read the instrument history (the process is indicated by a progress bar). **Instrument History** window opens upon reading completion.



Instrument operation history consists of the following events:

- Turning the instrument ON;
- Turning the instrument OFF (except the cases when the instrument is turned off by removing its battery);
- Calibration (manual calibration only);
- Test¹;
- Neutron Search² (count rate value by neutron channel);
- Gamma Search (count rate value by gamma channel);
- Alarm by Neutron channel² (neutron channel threshold exceeding);
- Alarm by Gamma channel (gamma channel threshold exceeding);
- Gamma Dose Rate¹ (DER value);
- Gamma Dose (DE value);
- Dose Rate threshold (first/second¹) (DER **threshold**) exceeding;
- Dose threshold exceeding;

Each event is described by date (day/month/year), time (hours/minutes) and meaning (besides such events as turning the instrument on and off, and instrument calibration).

¹ For PM1703MO-1B, PM1703MO-1A instruments only

² If software communicates with gamma detector, no neutron channel data will be presented in the history.

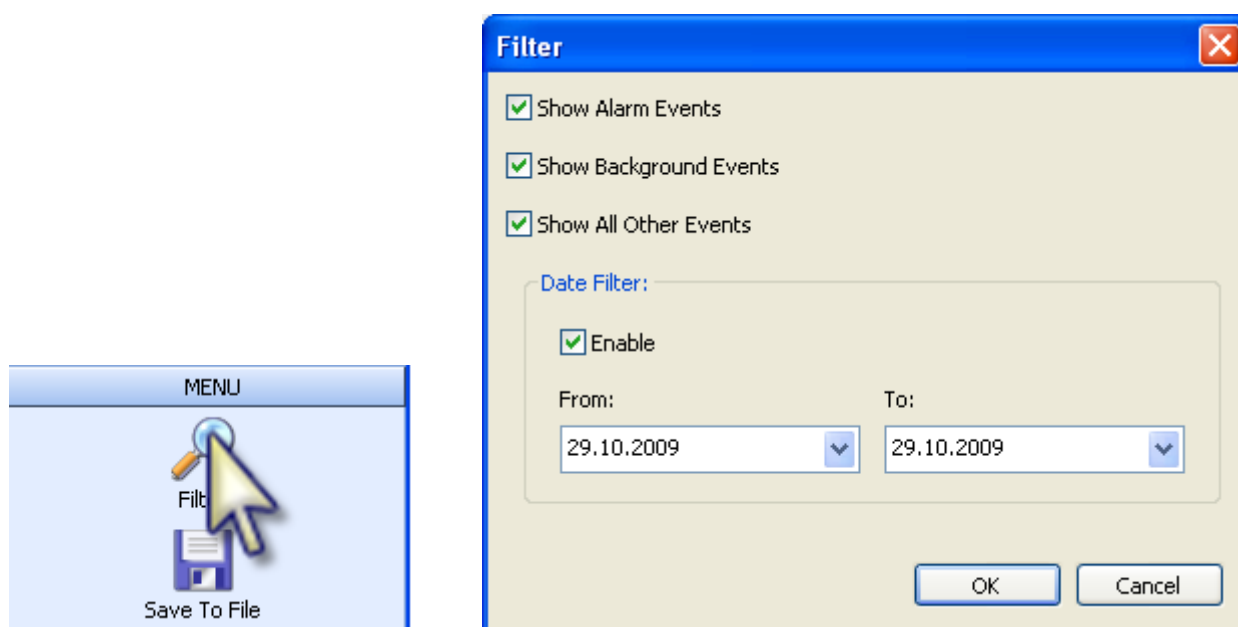
WORKING WITH HISTORY

READ HISTORY MODE MENU

History Filter

Press **Filter** button in the **Instrument History** window dynamic menu to open **Filter** window with filtering criteria.

Software enables any filtering criteria combinations.



By default the window displays all read events.

Use following criteria for filtering:

- **Show Alarm Events** - flag this check-box to display exceeded threshold events only.
- **Show Background Events** - flag this check-box to display background events recorded in time interval specified in the settings.
- **Show All Other Events** - flag this check-box to display events of turning the instrument on/off, as well as instrument's calibration events (manual calibration).
- **Date Filter** - flag this check-box to limit the viewed history range by determined time interval;

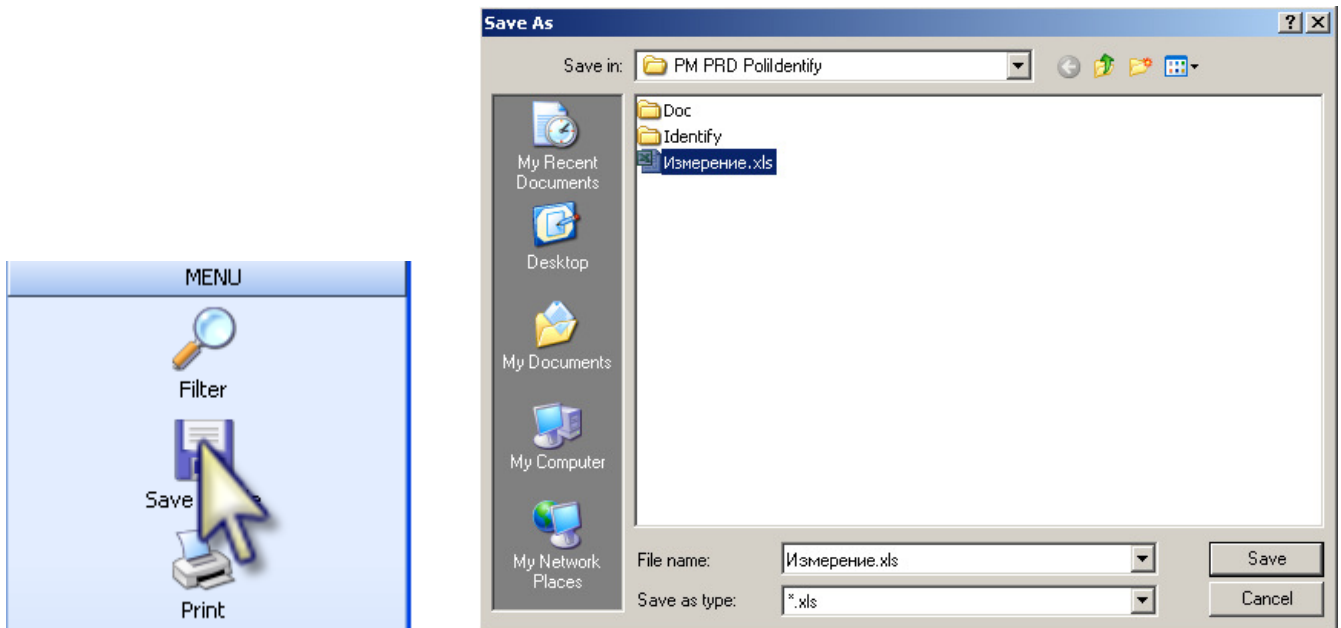
Use drop-down calendar window to set start/end dates:

- **From:** - set desired start date in dd/mm/yy format;

- **To:** - set desired end date in dd/mm/yy format;

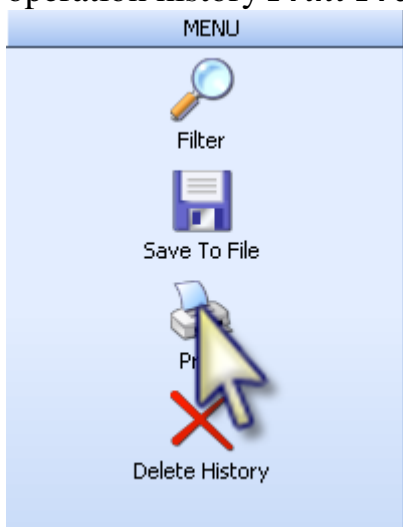
Save History to File

Press **Save to File** button of dynamic menu in **Instrument History** window to open standard **Save As** window to save history as (*.xls) file into required folder.



Print History

Press **Print** button of the **Instrument History** dynamic menu to open instrument operation history **Print Preview** window.



PM PRD PolIdentify Software Laptop / Desktop Edition

Print Close


17.10.2009	16:52	Gamma dose rate	9 µR/h
17.10.2009	16:52	Gamma dose	1.462 mR
17.10.2009	17:52	Gamma dose rate	9 µR/h
17.10.2009	17:52	Gamma dose	1.473 mR
17.10.2009	18:52	Gamma dose rate	9 µR/h
17.10.2009	18:52	Gamma dose	1.483 mR
17.10.2009	19:52	Gamma dose rate	9 µR/h
17.10.2009	19:52	Gamma dose	1.494 mR
17.10.2009	20:52	Gamma dose rate	9 µR/h
17.10.2009	20:52	Gamma dose	1.505 mR
17.10.2009	21:52	Gamma dose rate	9 µR/h
17.10.2009	21:52	Gamma dose	1.514 mR
17.10.2009	22:52	Gamma dose rate	11 µR/h
17.10.2009	22:52	Gamma dose	1.524 mR
17.10.2009	23:52	Gamma dose rate	9 µR/h
17.10.2009	23:52	Gamma dose	1.534 mR
18.10.2009	0:52	Gamma dose rate	9 µR/h
18.10.2009	0:52	Gamma dose	1.544 mR
18.10.2009	1:52	Gamma dose rate	9 µR/h
18.10.2009	1:52	Gamma dose	1.555 mR
18.10.2009	2:52	Gamma dose rate	11 µR/h
18.10.2009	2:52	Gamma dose	1.565 mR
18.10.2009	3:52	Gamma dose rate	9 µR/h
18.10.2009	3:52	Gamma dose	1.575 mR
18.10.2009	4:52	Gamma dose rate	9 µR/h
18.10.2009	4:52	Gamma dose	1.585 mR
18.10.2009	5:52	Gamma dose rate	9 µR/h
18.10.2009	5:52	Gamma dose	1.595 mR
18.10.2009	6:52	Gamma dose rate	9 µR/h
18.10.2009	6:52	Gamma dose	1.606 mR
18.10.2009	7:24	Alarm gamma	9 µR/h
18.10.2009	7:52	Gamma dose rate	9 µR/h
18.10.2009	7:52	Gamma dose	1.618 mR
18.10.2009	8:52	Gamma dose rate	9 µR/h
18.10.2009	8:52	Gamma dose	1.629 mR
18.10.2009	9:52	Gamma dose rate	9 µR/h
18.10.2009	9:52	Gamma dose	1.640 mR
18.10.2009	10:52	Gamma dose rate	9 µR/h
18.10.2009	10:52	Gamma dose	1.650 mR
18.10.2009	11:52	Gamma dose rate	10 µR/h
18.10.2009	11:52	Gamma dose	1.659 mR
18.10.2009	12:52	Gamma dose rate	9 µR/h
18.10.2009	12:52	Gamma dose	1.669 mR
18.10.2009	13:52	Gamma dose rate	9 µR/h
18.10.2009	13:52	Gamma dose	1.679 mR
18.10.2009	14:52	Gamma dose rate	11 µR/h
18.10.2009	14:52	Gamma dose	1.689 mR
18.10.2009	15:52	Gamma dose rate	9 µR/h
18.10.2009	15:52	Gamma dose	1.699 mR

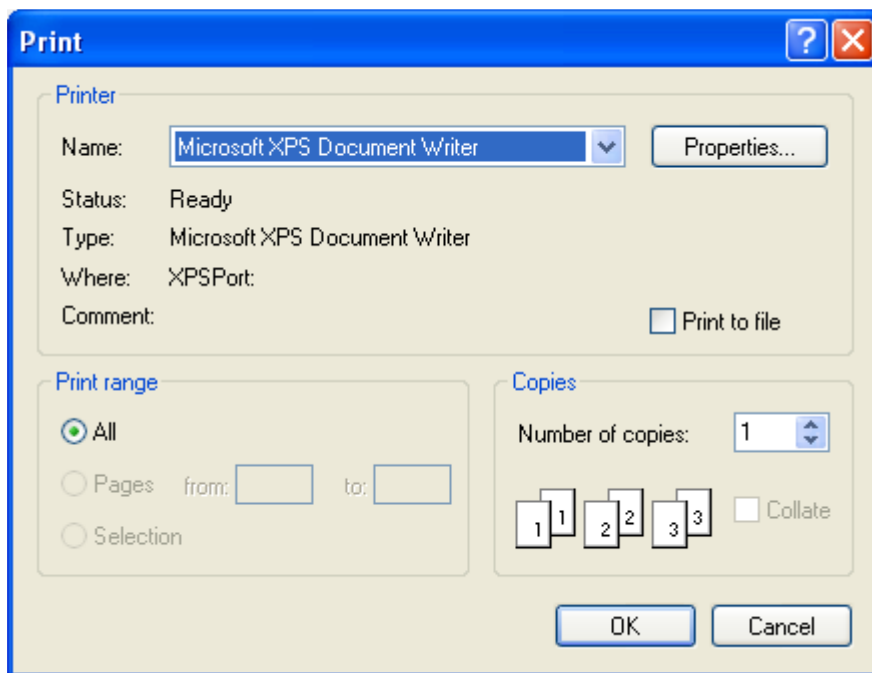
Page 1

GPS: N/A NPNET: Off BATT: 80 % PM_Pager#000

Use **Print Preview** window to adjust print settings.

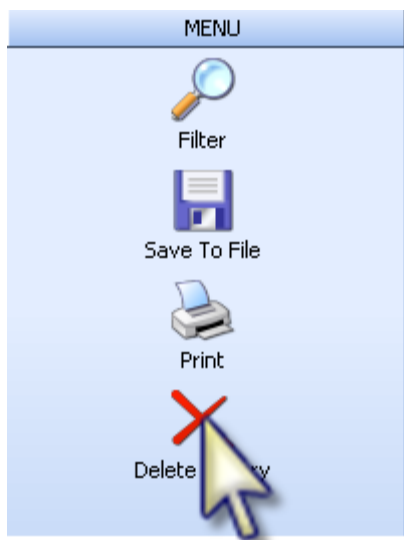


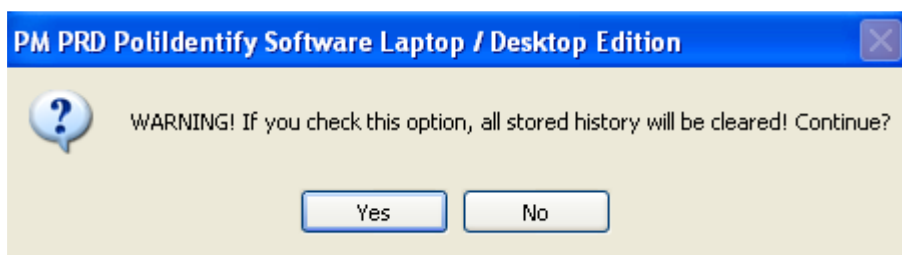
Press  toolbar button to start printing. A standard dialogue window of general printer settings appears. Make all the necessary settings and press **OK**.



Delete History

To delete (clear) history from instrument memory, press **Delete History** button in the **Instrument History** window dynamic menu.





Software asks for confirmation to delete all the stored history from instrument memory. Press **Yes** to confirm, or **No** to cancel. When all the history was deleted, new operation history will be recorded anew.

START SPECTRUM MODE

Attention!



Before accumulating the spectrum it is necessary to get the reference source spectrum in the same conditions as for spectra that will be gathered from the object under test. Be sure that measurement conditions during gathering spectrum are constant.

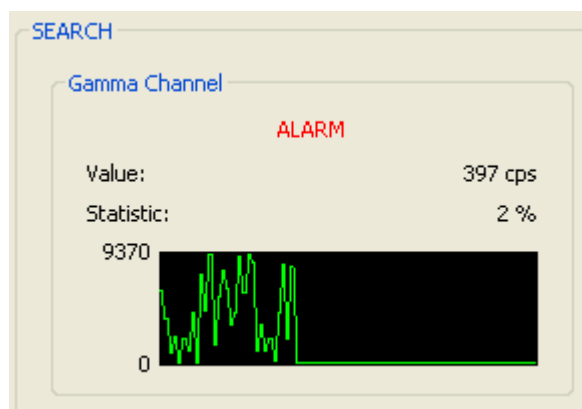
To get the reference spectrum you have to position the reference source near the geometrical center of gamma detector (the distance must be 5 cm at least) and perform actions described below.

When the accumulation is over and reference spectrum is recorded to the instrument's memory it is necessary to take the reference source away the instrument.

Loading of gamma channel in the process of spectrum accumulation is an important requirement for getting reliable spectrum. Over- or under-loading of gamma channel distorts it and leads to unreliable results.

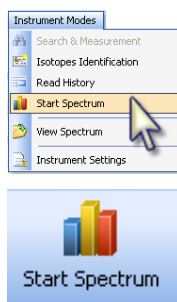
The manufacturer recommends checking of gamma channel loading in the **Search & Measurement** mode before switching the instrument into **Start Spectrum** mode.

The average count rate of the registered photon radiation impulses and the average count rate statistical error by scintillation detection block (SDB) are displayed in the **Gamma Channel** field of **Search & Measurement** mode. Place the instrument at such a distance to the tested object so that count rate by SDB is in the range between 300 and 400 cps.



Switch the instrument to the *Start Spectrum* mode when the gamma channel is loaded as needed.

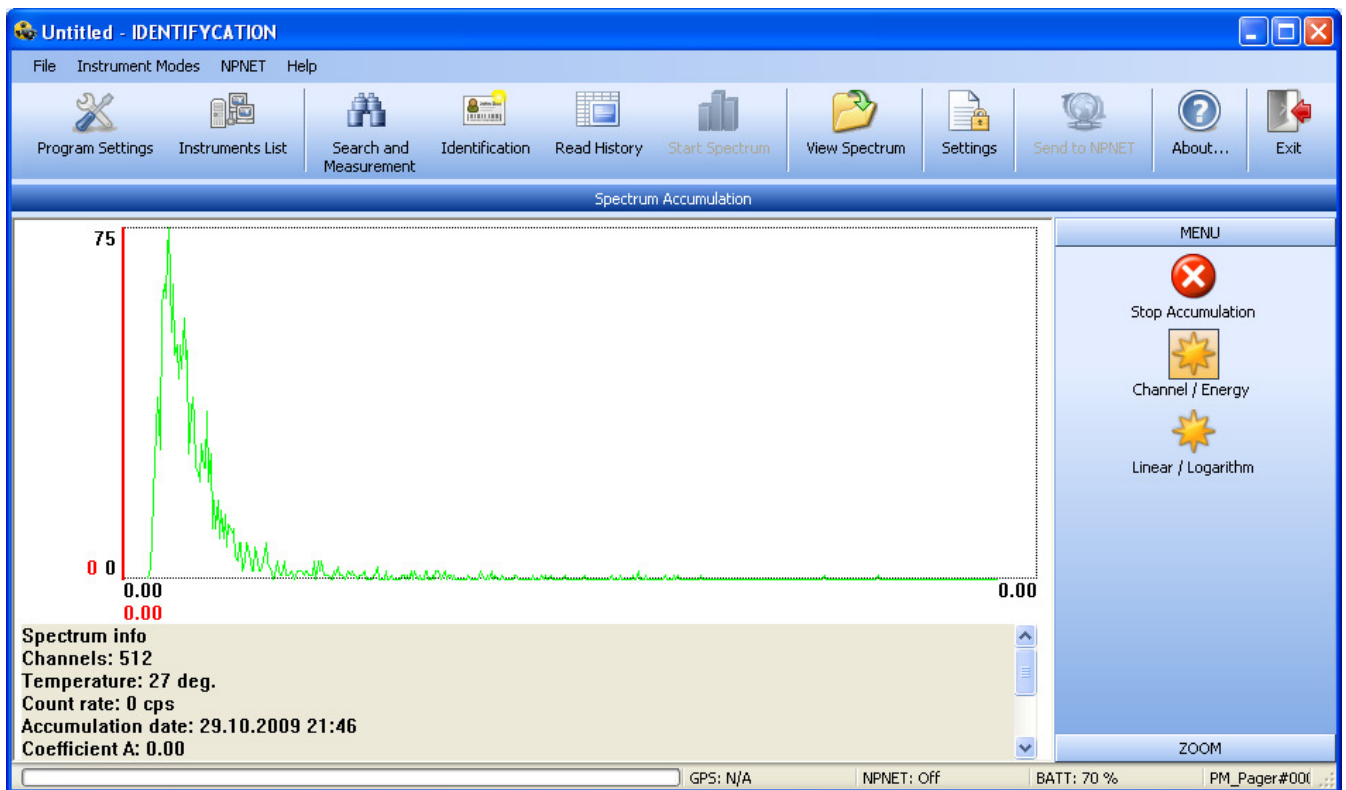
Use one of the following ways* to switch instrument into *Start Spectrum* mode:



*Select *Instrument Modes* menu and click *Start Spectrum* command;

*Press this toolbar button.

When waiting period is over (several seconds), the progressive graph of the spectrum being accumulated will be displayed in the *Spectrum Accumulation* window. Service information on the accumulated spectrum is displayed in the lower window part.



Instrument accumulates spectrum by 512 channels. The capacity of each channel is 65536. It is necessary to accumulate not less than 10^4 impulses in the maximum count channel to get a good quality spectrum.

Besides, spectrum accumulation time can be determined visually according to sharpness of the PC-displayed peaks. If you see clearly distinguishable peaks on the graph, you can stop the spectrum accumulation process.

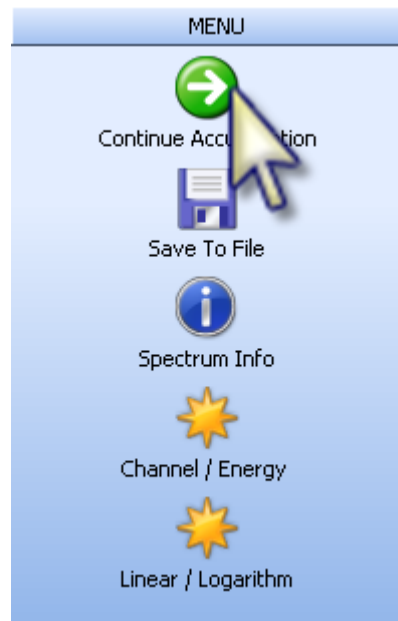
To stop the spectrum accumulation process, click *Stop Accumulation* command of the *Spectrum Accumulation* window dynamic menu.

To continue spectrum accumulation, click *Continue Accumulation* command of the *Spectrum Accumulation* window dynamic menu.

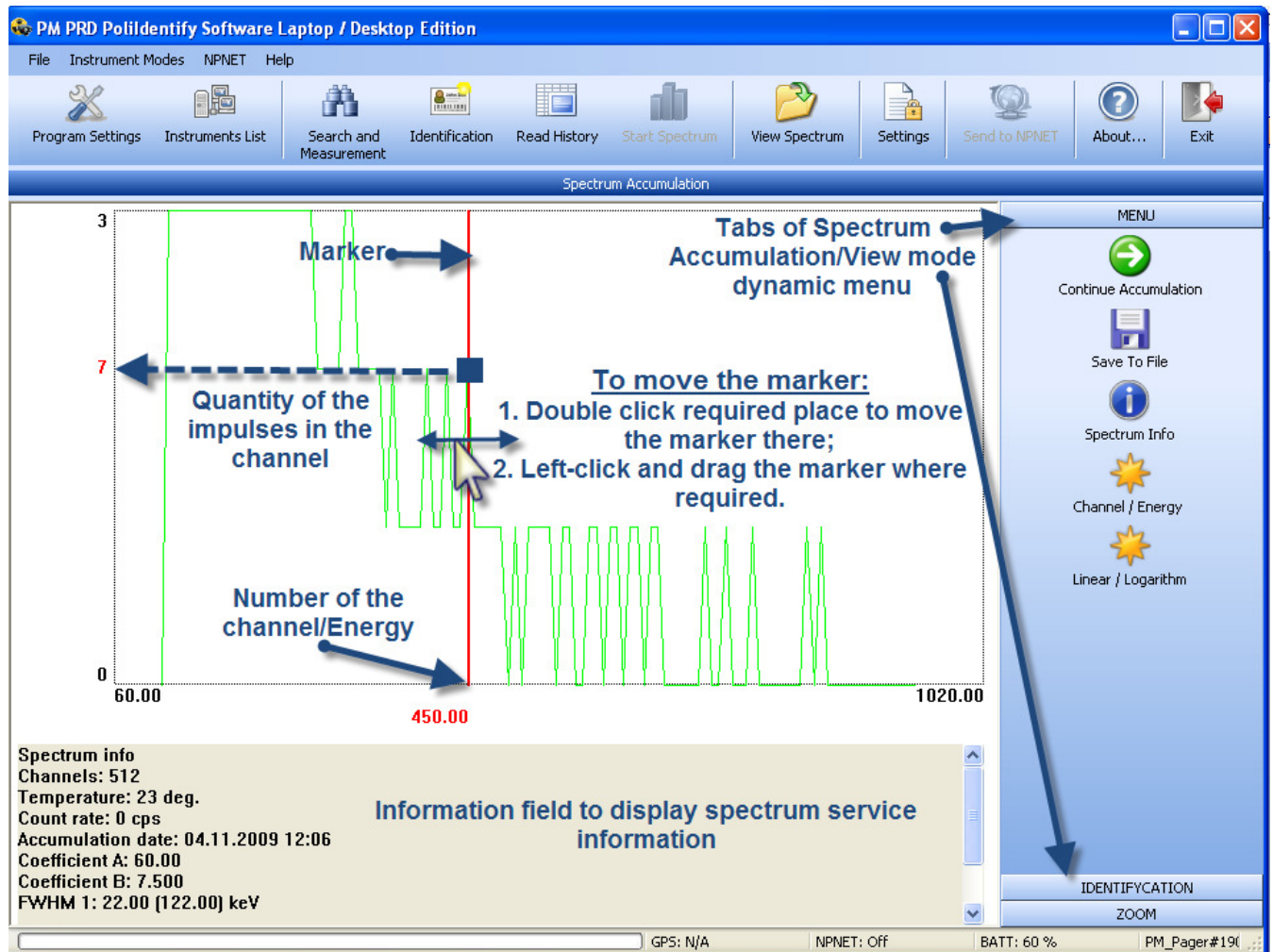


Note!

Stop Accumulation command doesn't stop spectrum accumulation, but hides it. Click *Continue Accumulation* command to display the process again. At that user will see the spectrum accumulated in hidden mode as well, i.e. when *Stop Accumulation* command was active.



Full menu of the *Start Spectrum* mode opens when the spectrum accumulation is stopped.



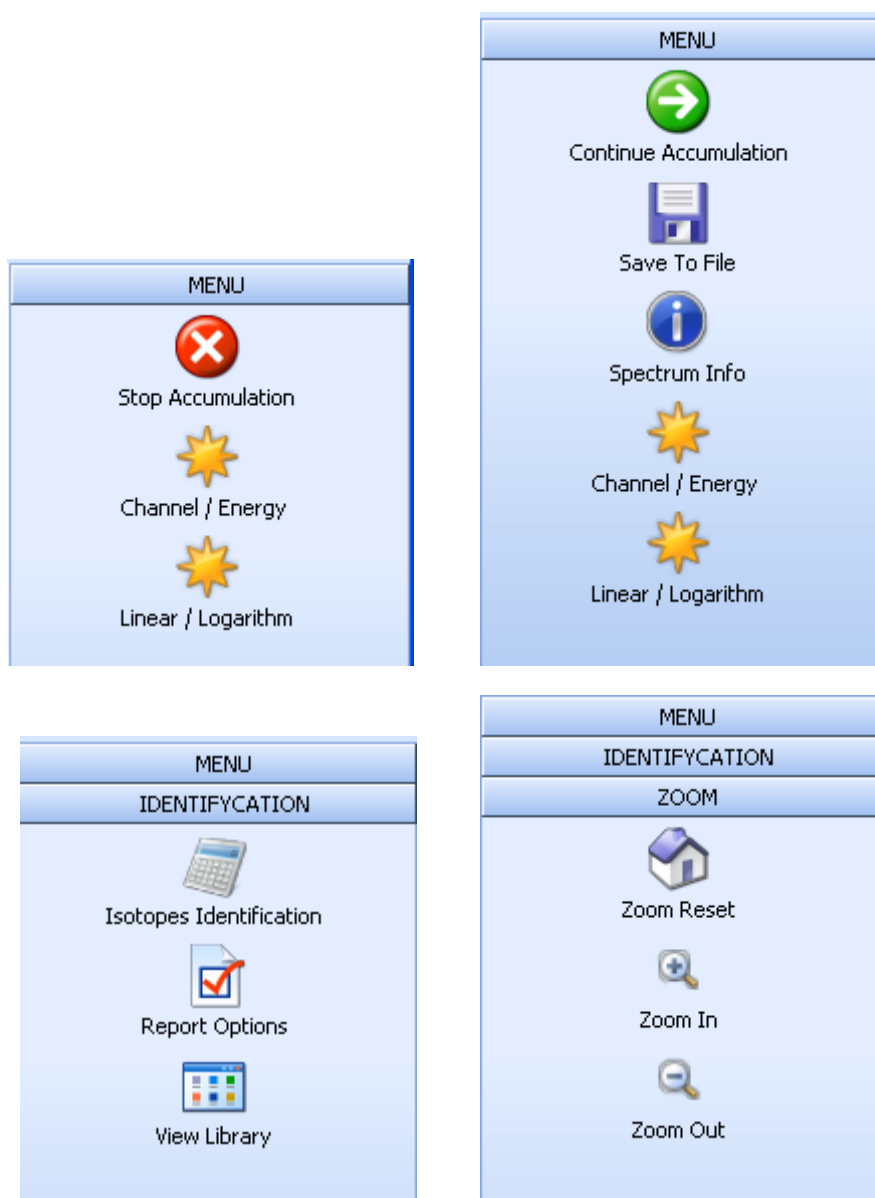
Lower window part displays report on the task being processed or completed:

The following is displayed depending on the task:

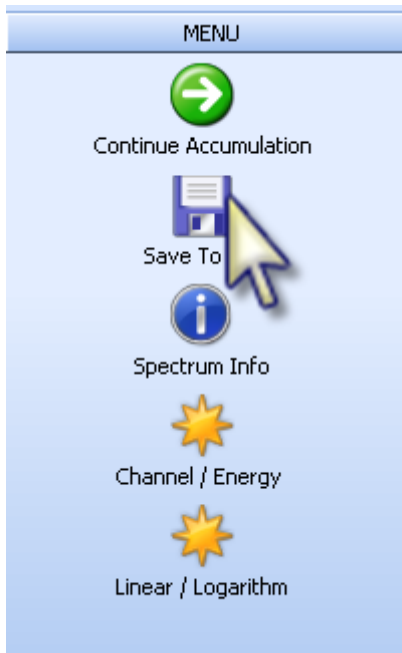
- Service information on spectrum in the *Start Spectrum* mode (refresh time ≈ 10 sec) or in *View Spectrum* mode;
- Identified isotopes (list of identified isotopes) in the *Identification* mode;
- List of the isotopes recorded in the set library in the *View library* mode. Go to *Program Settings* to select the library.

START SPECTRUM MODE MENU



Start Spectrum mode menu functions enable user to analyze and process spectrum information as it is provided for saved spectra in *View Spectrum* mode. See *View Spectrum* for description of the functions.

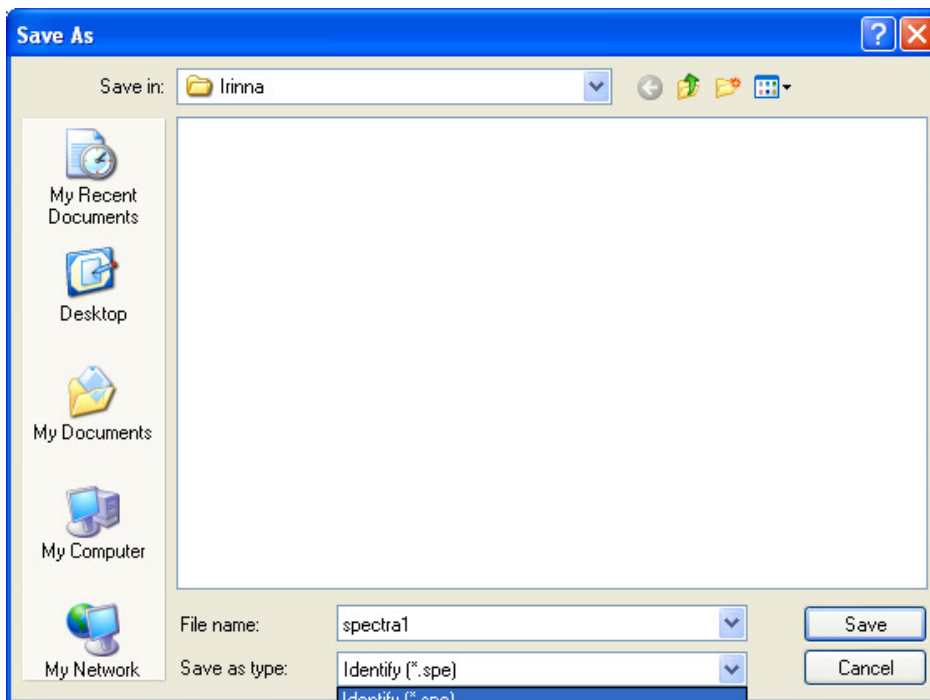


Save Accumulated Spectra



Press ***Save to File*** button of dynamic menu to open standard ***Save As*** window to save spectrum to user selected folder. Two formats are available for saving:

-  *.spe – for Identify program
-  *.xml – according to ANSI 42.42 standard



Spectrum saved under entered name can be viewed in the *View Spectrum* mode.

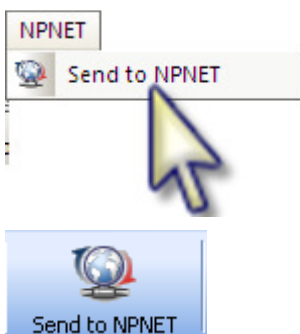
Send Spectrum to NPNET Information System



Note!

Transfer of geotagged accumulated spectrum file requires GPS module (external (USB) or internal) connected to a PC. This function should be activated in **Program Settings**.

Use one of the following ways* to transfer accumulated spectrum to NPNET system:



* Select *NPNET* menu and click *Send to NPNET* command;

* Press this toolbar button;

The following information will be transferred to web-server:

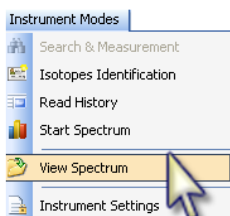
- Accumulated spectrum file;
- Geographic coordinates (latitude/longitude) received from the PC-connected GPS module¹;
- Current date/time.

¹ **Geographical coordinates may not be available if:**

- GPS module is currently inside a building,
- GPS module is in the open country though shadowed of huge objects or buildings,
- GPS receiver gets signals from less than three satellites

VIEW SPECTRUM MODE

Use one of the following ways* to view accumulated spectra, stored in PC memory:

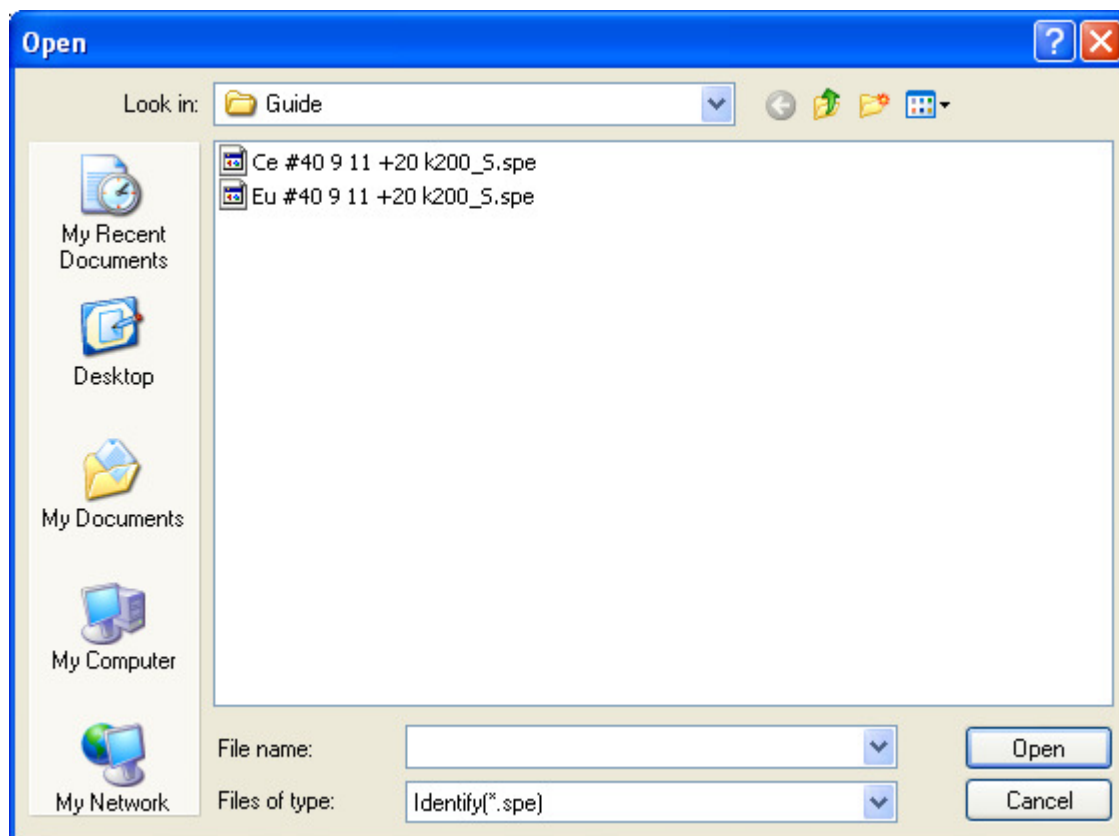


*Select *Instrument Modes* menu and click *View Spectrum* command;

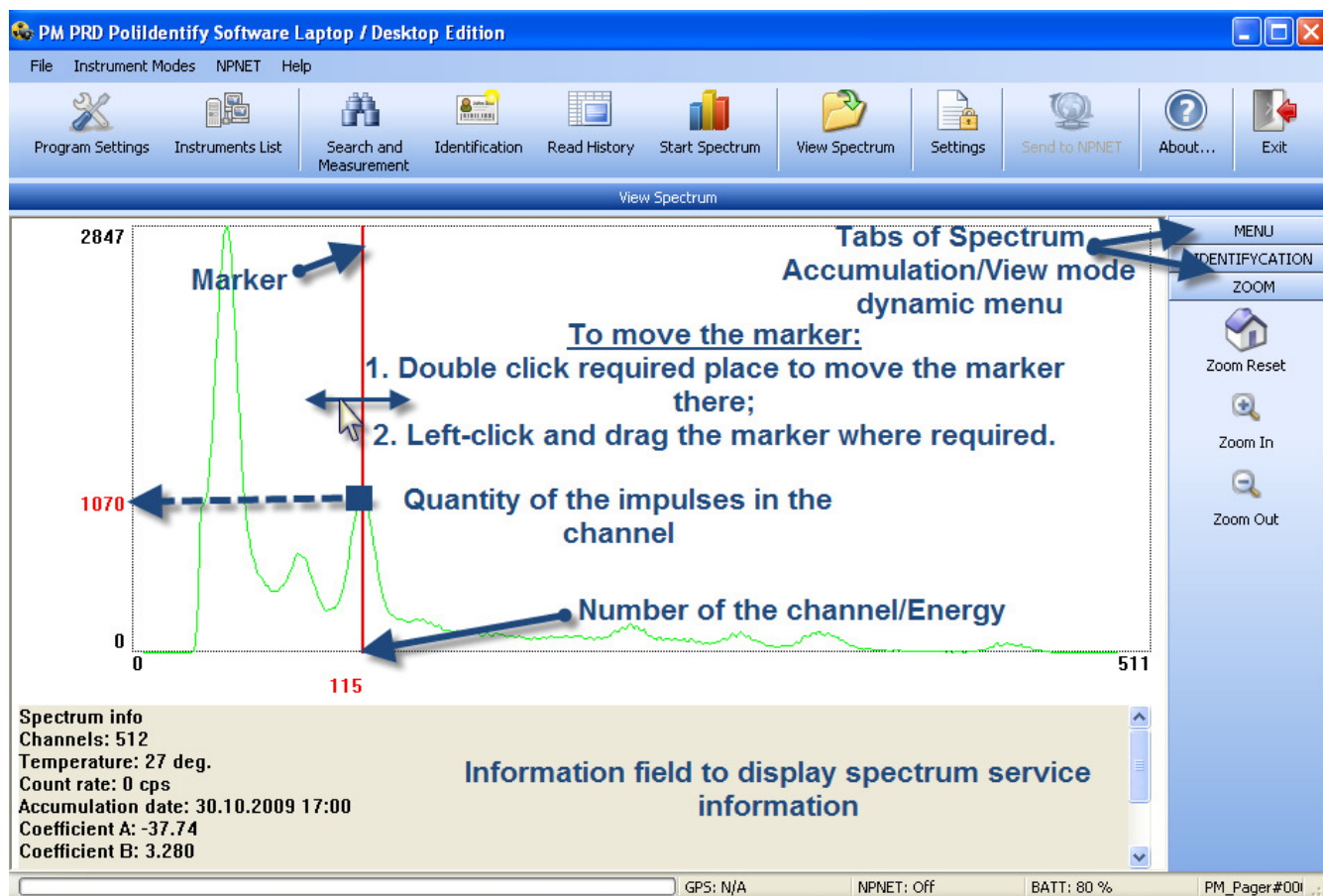


*Press this toolbar button.

Press *View Spectrum* command to open standard *Open* window. Select required name of the saved spectrum (see **Start Spectrum** mode).



Spectrum view window opens.



Lower window information part displays report on the task being processed or completed:

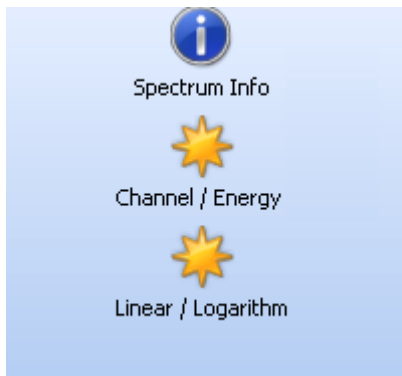
The following is displayed depending on the task:

- Service information on spectrum in the **Start Spectrum** mode (refresh time ≈ 10 sec) or in **View Spectrum** mode;
- Identified isotopes (list of identified isotopes) in the **Identification** mode;
- List of the isotopes recorded in the set library in the **View Library** mode. Go to **Program Settings** to select the library.

WORKING WITH SPECTRUM

View Spectrum Mode Menu

MENU Tab

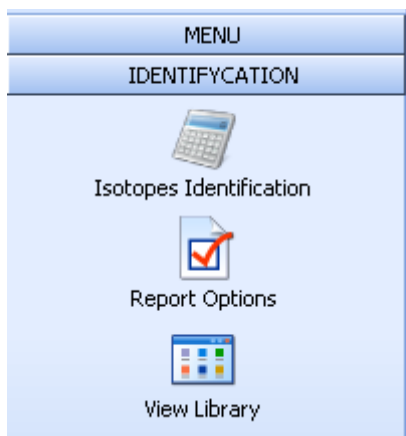


➤ **Spectrum Info** – lower window part displays spectrum information: spectrum name, date and time of spectrum accumulation, temperature of spectrum accumulation, average count rate of Gamma Channel and quantity of the channels by which the spectrum was accumulated;

➤ **Channel\Energy** – Press to display a spectrum where the X axis represents energy;

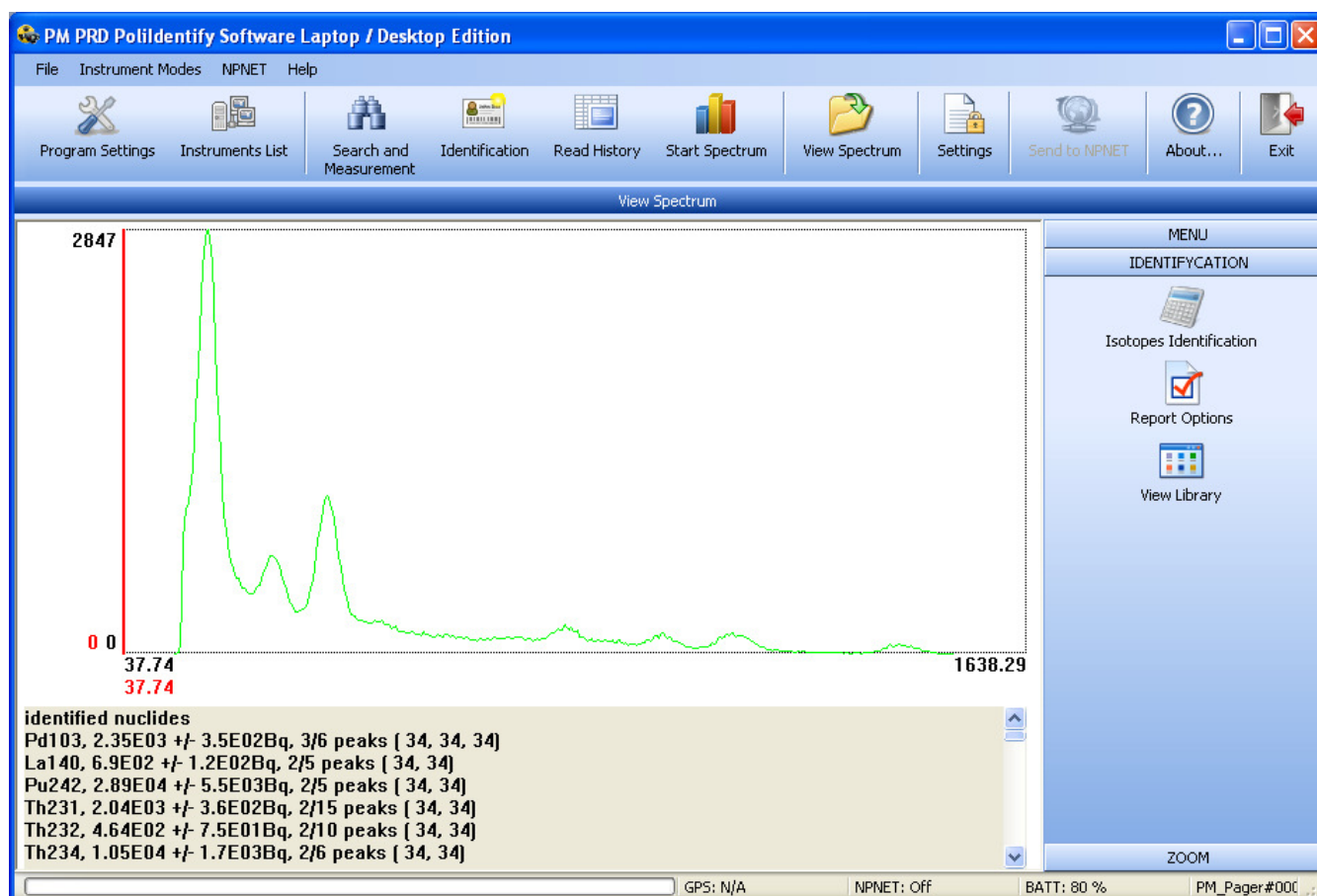
➤ **Linear\Logarithm** – Press to toggle between the linear and logarithm mode of spectrum representation along the X axis.

Identification Tab

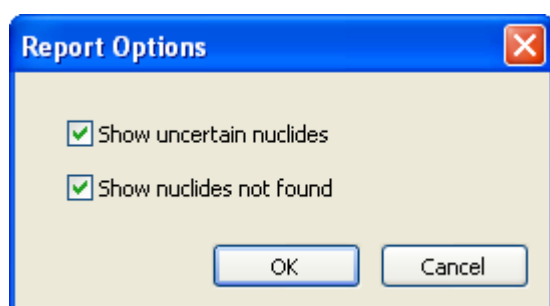


+ **Isotopes Identification** - Identification of radionuclide composition by spectrum. Lower window part displays full list of identified isotopes. Isotopes identification range is limited by the library set in the *General* tab in **Program Settings**.

See Appendix A for identification report details.



➤ **Report Options** – press to select identification report format.



Show uncertain nuclides (isotopes) - flag this option to display possibly identified isotopes in the identification report list;

Show nuclides (isotopes) not found - flag this option to display isotopes not found in the current spectrum in the identification report list.

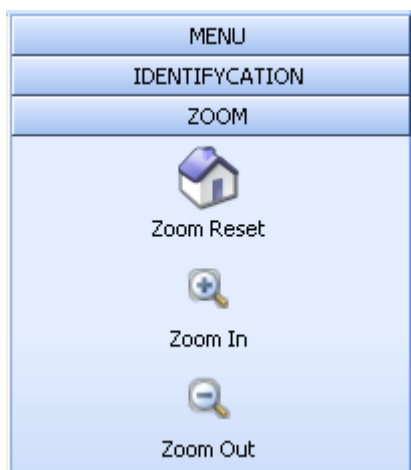
If both check-boxes are not flagged - the identification report will include uniquely identified isotopes only.

Software enables any Report Options combinations.

➡ **View library** – isotopes recorded in the set isotope library are listed in the lower information part of the window. Isotope library is selected from the list of all the recorded libraries in **Program Settings/General Tab**. By default the **Lib_ful.lib** library with full isotopes list is activated.

See Appendix A for a full isotopes list with comments.

Zoom Tab



➡ **Zoom In\Out** – press to zoom displayed spectrum in\out.

➡ **Zoom Reset** – press to cancel all spectrum zooming.

When zooming in, you can move the spectrum relative to X axis by the mouse. Doing so, left-click and drag the picture into desired direction relative to X axis.

INSTRUMENT SETTINGS



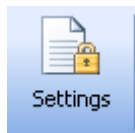
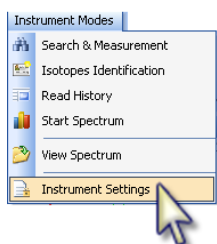
Attention!

Untrained user is prohibited to configure instrument operation settings since it may cause instrument malfunction.



Only properly trained and qualified personnel are recommended to get access to instrument operation settings and their adjustment.

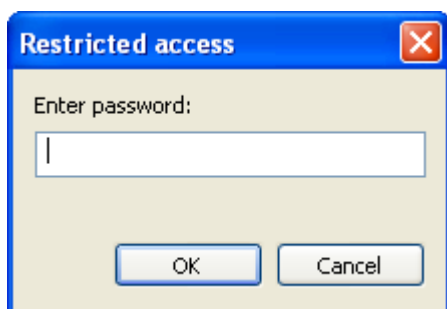
Use one of the following ways* to read *Instrument Settings*:



*Select *Instrument Modes* menu and click *Instrument Settings* command;

*Press this toolbar button.

Instrument Settings are protected by password.

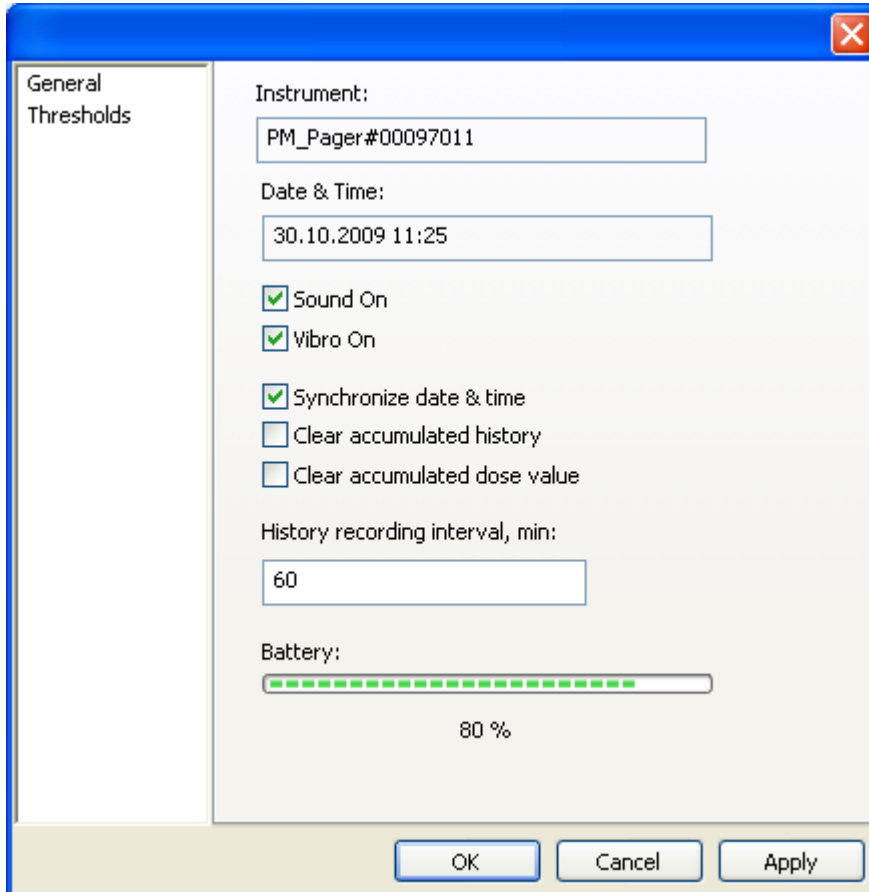


Default access password is "1".

Access password is case-sensitive.

To change password, click *Program Settings/General Tab*.

The program will take some time to read the instrument history (the process is indicated by a progress bar). The ***Instrument Settings*** window opens upon reading completion.



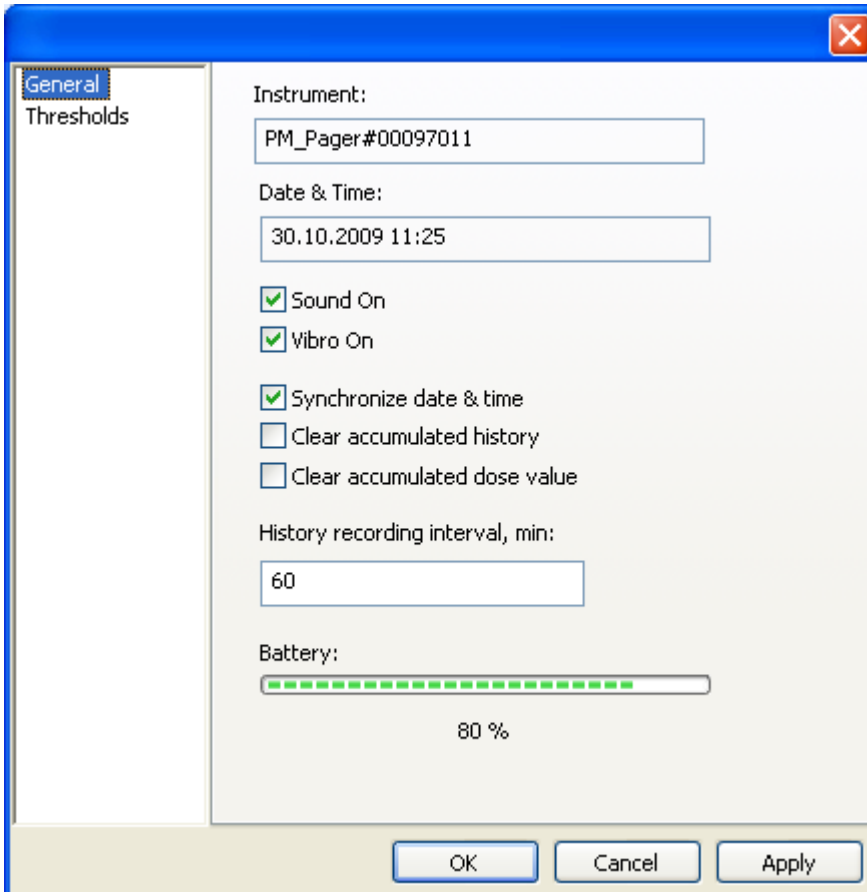
The image shows a screenshot of the 'Instrument Settings' dialog box. The window has a blue title bar with a close button (X) in the top right corner. On the left side, there is a tab labeled 'General' and a sub-tab labeled 'Thresholds'. The main area of the dialog contains the following settings:

- Instrument:** A text box containing 'PM_Pager#00097011'.
- Date & Time:** A text box containing '30.10.2009 11:25'.
- Sound On:** A checked checkbox.
- Vibro On:** A checked checkbox.
- Synchronize date & time:** A checked checkbox.
- Clear accumulated history:** An unchecked checkbox.
- Clear accumulated dose value:** An unchecked checkbox.
- History recording interval, min:** A text box containing '60'.
- Battery:** A progress bar showing 80% charge, with the text '80 %' displayed below it.

At the bottom of the dialog, there are three buttons: 'OK', 'Cancel', and 'Apply'.

GENERAL INSTRUMENT SETTINGS

General Tab



The screenshot shows a software window titled "General Instrument Settings" with a blue border and a close button in the top right corner. On the left, there is a sidebar with two tabs: "General" (selected) and "Thresholds". The main area contains the following settings:

- Instrument:** A text box containing "PM_Pager#00097011".
- Date & Time:** A text box containing "30.10.2009 11:25".
- Sound On:** A checked checkbox.
- Vibro On:** A checked checkbox.
- Synchronize date & time:** A checked checkbox.
- Clear accumulated history:** An unchecked checkbox.
- Clear accumulated dose value:** An unchecked checkbox.
- History recording interval, min:** A text box containing "60".
- Battery:** A progress bar showing 80% charge, with the text "80 %" below it.

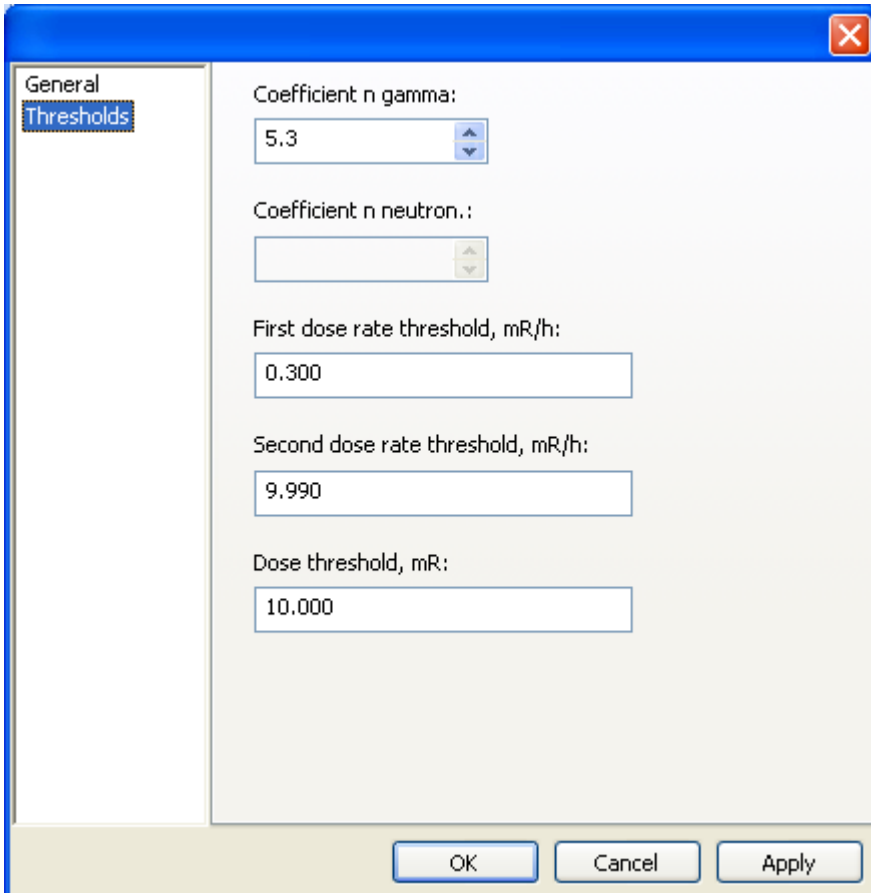
At the bottom of the window are three buttons: "OK", "Cancel", and "Apply".

- ◆ **Instrument** - instrument serial number.
- ◆ **Date & Time** - read internal instrument time.
- ◆ **Sound ON** - flag this check-box to activate automatic sound alarm if instrument detects radioactive materials within its control zone (if specified thresholds are exceeded)
- ◆ **Vibro ON** - flag this check-box to activate automatic vibration alarm if instrument detects radioactive materials within its control zone (if specified thresholds are exceeded);
- ◆ **Synchronize date & time** – synchronize instrument and PC internal time.
- ◆ **Clear accumulated history** – forced cleaning history from the instrument.
- ◆ **Clear accumulated dose value** – reset accumulated equivalent dose value in the instrument memory.

- **History recording interval, min** - set time interval (in minutes) between two successive event recordings to the instrument history.
- **Battery** – a bar shows instrument battery charge level graphically and in percents.

SETTING THRESHOLDS

Thresholds Tab



Attention!



➤ **N-coefficient** (number of square deviations) determines **alarm threshold** values (minimum detection level) by gamma and neutron channels separately in **Search Gamma-Neutron mode Gamma Channel/Neutron sub-mode**.

➤ The instrument calculates **alarm threshold** values on the basis of specified **n-coefficients** and calculated average count rate of impulses per second during the calibration period.

- The lower n-coefficient value is, the lower alarm threshold is and, hence, the higher instrument sensitivity is. At the same time, probability of false instrument response increases.
- Setting range of coefficients is from 1 to 9.9 with discreteness 0.1.
- If **alarm threshold** is exceeded by any of the channels, the instrument will turn on Alarms (sound and/or external vibration alarm).



The manufacture guarantees instrument technical characteristics during sources detection and frequencies of false responses at specified n-coefficients. For n-coefficients see instrument Operation Manual.

- **Coefficient n gamma** — entry field of n-coefficient value for gamma channel.
- **Coefficient n neutron** — entry field of n-coefficient for neutron channel.

Setting range of coefficients is from 1 to 9.9 with discreteness 0.1.

When necessary n-coefficient value is specified, the program automatically displays **Calibration sub-mode** (see **Search & Measurement mode**).

- **First/Second dose rate threshold, mR/h¹** — entry fields for fixed value of the First and Second DER threshold in mR/h (mSv/h). Thresholds setting range corresponds to DER measurement range.
- **Dose threshold, mR (mSv)²** — entry field for fixed DE threshold value in mR (mSv). Threshold setting range corresponds to DE indication range.

Click **Apply** to save new threshold settings.

¹ Two-level control for DER and DE threshold are available for PM1703MO-1B, PM1703MO-1A instruments only.

² Two-level control for DER and DE threshold are available for PM1703MO-1B, PM1703MO-1A instruments only.

ADVANCED PROGRAM MODE. INSTRUMENT SETTINGS

Advanced software mode is enabled by starting "**PM PRD PoliIdentify Software Laptop/Desktop Edition**" using additional command-string option (ADVANCED). Advanced mode enables access to extended instrument settings reading.

ADVANCED PROGRAM START

To start program in advanced mode: enter program file name with full path name (limiting that command string with (") symbols, adding **/ADVANCED** option, in the command string window.



By default software is installed into Program Files\Polimaster folder of the system driver (here we deal with C driver).

So, executed file path looks like that:

"C:\Program Files\Polimaster\PM PRD PoliIdentify Software\PRD PoliIdentify.exe"
/advanced

Pay attention to inverted commas ("), space (), and slash (/) signs before **ADVANCED**.

Use on of the following ways to open command string window:

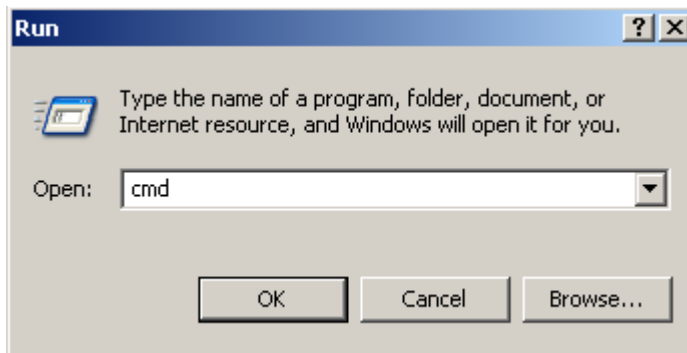
1. Click *Start > Programs > Standard > Command String*.

A screenshot of a Windows XP Command Prompt window. The title bar reads "C:\ Command Prompt". The window content shows the following text: "Microsoft Windows XP [Version 5.1.2600] Copyright 1985-2001 Microsoft Corp." followed by the command "G:\Documents and Settings\sergeeva>"G:\Program Files\Polimaster\PM PRD PoliIdentify Software\PRD_PoliIdentify.exe" /advanced". The command is partially visible, with the path truncated in the screenshot.

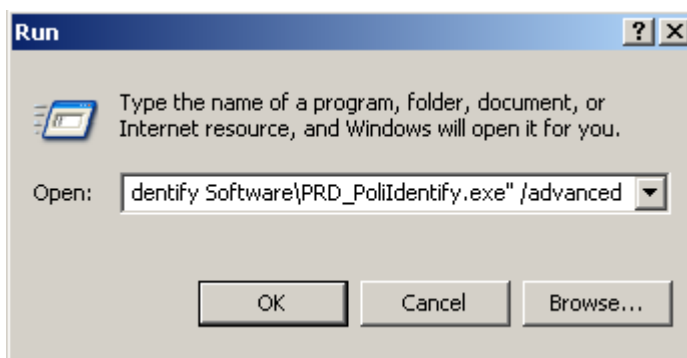
```
C:\ Command Prompt
Microsoft Windows XP [Version 5.1.2600]
Copyright 1985-2001 Microsoft Corp.

G:\Documents and Settings\sergeeva>"G:\Program Files\Polimaster\PM PRD PoliIdentify Software\PRD_PoliIdentify.exe" /advanced
```

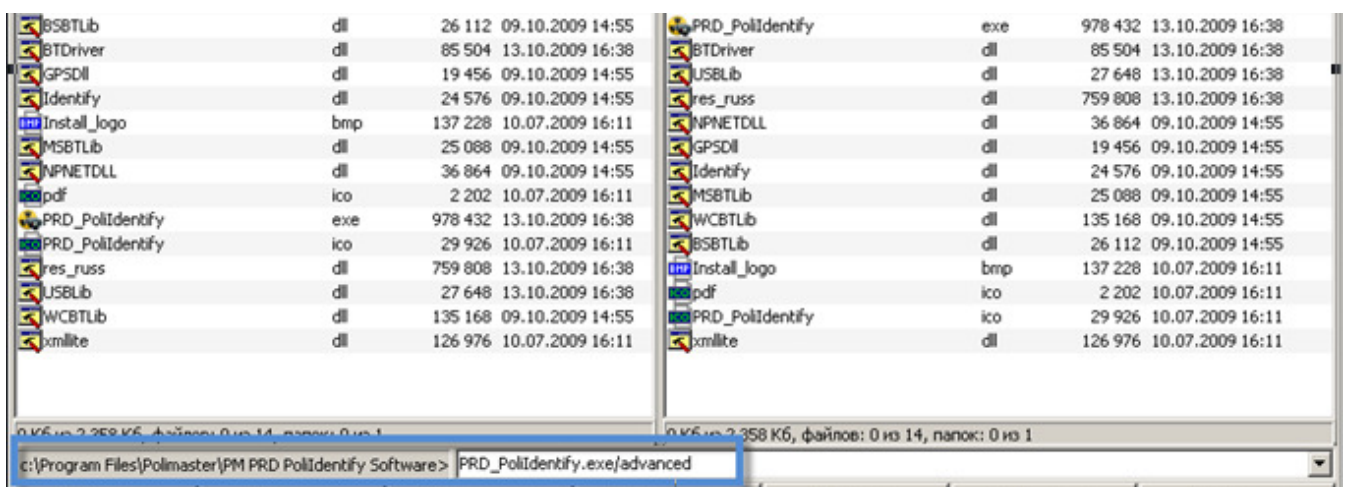

2. Click **Start > Run**. Enter *cmd* command in the *Run* window and press **OK**. Command string window opens. Enter executed file path with *ADVANCED* here.



3. Click **Start > Run**. Enter executed file path with *ADVANCED* in the *Run* window (*Open* field) not starting command string.

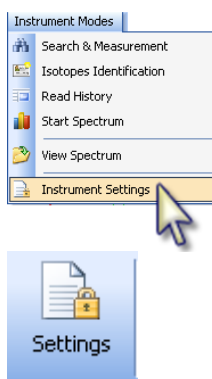


4. Executed file path with *ADVANCED* can be entered right in the *Address* field of any Windows file browser or manager application (Windows Explorer, Total Commander, etc.).



"PM PRD PoliIdentify Software Laptop/Desktop Edition PM2012M" main program window opens.

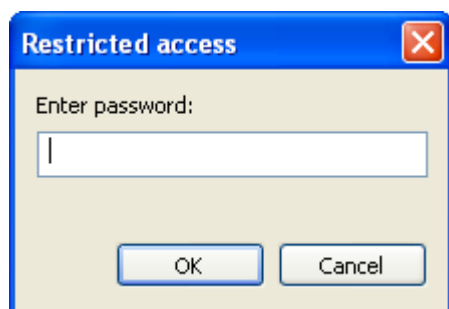
Use on of the following ways* to read *Instrument Settings*:



*Select *Instrument Modes* menu and click *Instrument Settings* command;

*Press this toolbar button.

Instrument Settings are protected by password.

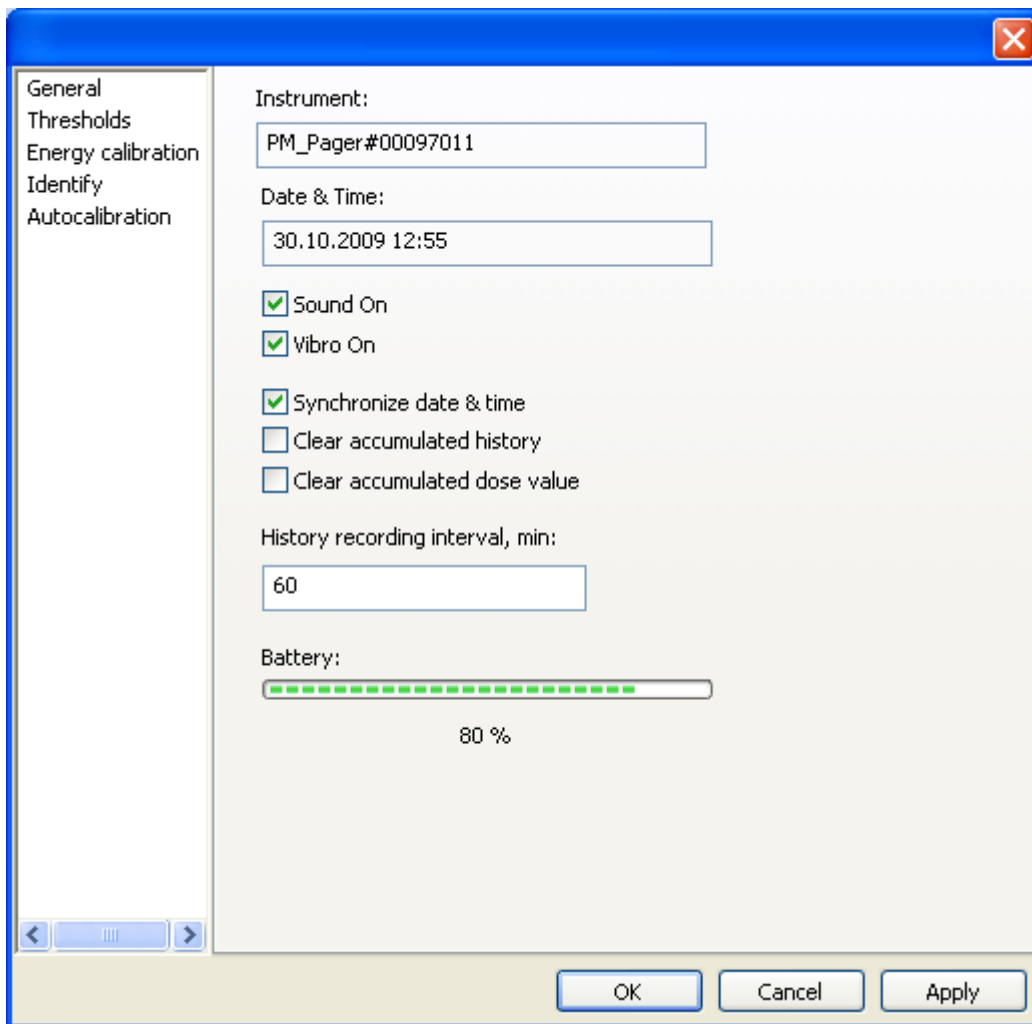


Default access password is "1".

Access password is case-sensitive.

To change password, click *Program Settings/General Tab*.

The program will take some time to read the instrument's history (the process is indicated by a progress bar). The **Advanced Instrument Settings** window opens upon reading completion.



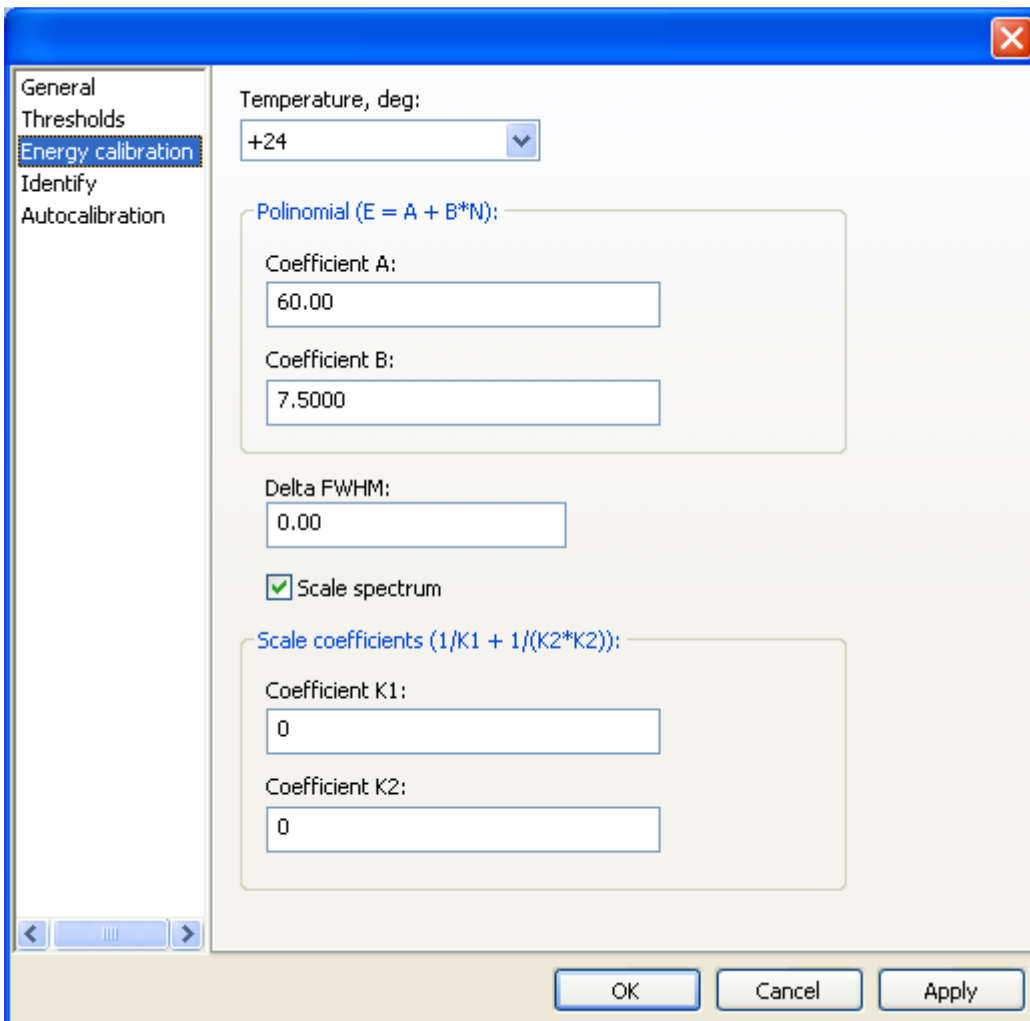
ENERGY CALIBRATION MODE SETTINGS

Energy Calibration Tab



Attention!

Untrained user is prohibited to configure energy calibration settings since it may cause instrument malfunction.



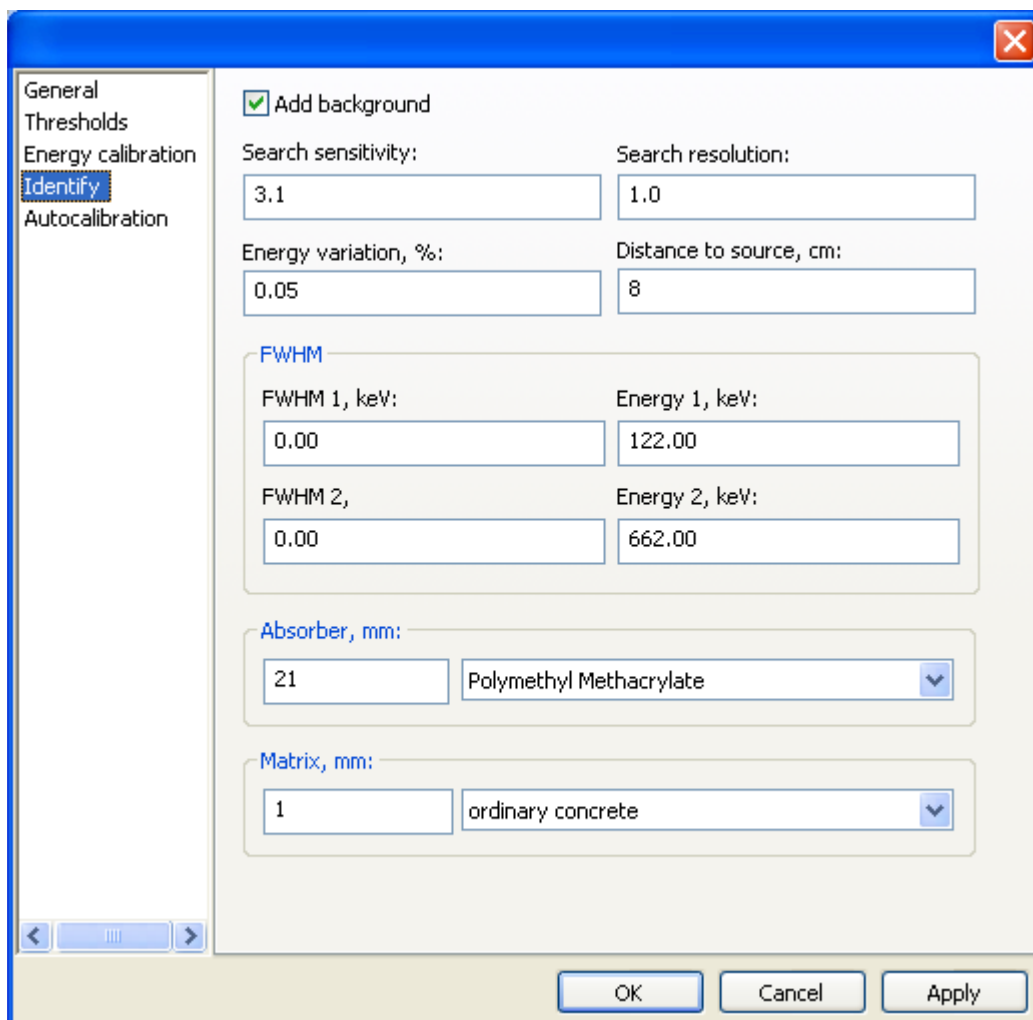
Temperature, deg. — drop-down list of instrument operating temperatures range with 4°C discreteness. Select current instrument operating temperature from the list.

A, B, dFWHM, K1 and K2 coefficients – they are calculated for every temperature value separately and recorded to the instrument by manufacturer trained personnel. The instrument uses these values for calibration.

Press ***Apply*** to save new settings.

IDENTIFICATION SETTINGS

Identify Tab



Attention!



It is **NOT RECOMMENDED** to change factory-preset parameters marked with an asterix (*). Only properly trained personnel can change such parameters. Only properly trained personnel can change such parameters.

It is **FORBIDDEN** to change factory-preset parameters marked with double asterix (**).

➡ **Add background***. If this check-box is flagged, the background line will be substituted in the energy range lower than the lower discrimination level. At that the identification energy range is widened.

➡ **Search sensitivity***. The recommended setting is 3.0. Settings within the range between 1.5 and 5 are allowed.

Lower values increase the sensitivity and number of detected peaks, but also increase the number of false peaks. Decrease this value if it is impossible to provide sufficient statistics.

It is recommended to specify higher values for better identification at sufficient statistics, i.e. when there is a possibility to substantially increase the time of spectrum accumulation.

➡ **Search resolution****. The initial recommended setting is 1.0. It is possible to change it within the range between 0.5 and 2. Decreasing this coefficient may sharpen the resolution of closely spaced peaks. Increasing this coefficient may eliminate false peaks determined by statistical runs.

➡ **Energy variation, %***. Relative deviation of the desired peak energy in percents. Within this range the peak may be assigned energy from the isotopes library. The recommended value is 1. It is possible to change it within the range 0.3 - 3. Decrease this value to narrow energies search range. Doing so you will consider fewer next to each other peaks from the isotopes library. Increase this value to widen the search energies range.

➡ **Distance to source, cm** – denotes the distance to the source in cm. If the distance value is known-good, Polimaster recommends to set certain value. Distance value is important for measuring source activity.

➡ **FWHM**

- **FWHM 1***. Width at the half-height of the first calibration point in keV. The recommended initial value is 38.0 (for energy of 122 keV).
- **Energy 1***. First calibration point energy. The recommended value is 122 keV.
- **FWHM 2***. Width at the half-height of the second calibration point in keV. The recommended initial value is 58.0 (for energy of 662 keV).
- **Energy 2***. Second calibration point energy. The recommended value is 662 keV.

➡ **Absorber, mm**. First field with digits shows thickness of absorber along the line connecting the detector and the source centers. The default value is 0. This setting affects the form of the software-generated spectrum, considering the absorption dependence in the energy range for the specified absorbing material. Second field represents drop-down list with absorber material names. Is used when considering the absorption dependence in the energy range for the specified material.

✚ **Matrix, mm.** First field with digits shows thickness of material, in which the source is evenly distributed. The thickness is measured along the line connecting the detector and the source centers, in mm. The default value is 0. This setting affects the form of the software-generated spectrum, considering the absorption dependence in the energy range for the specified matrix material. Second field represents drop-down list with matrix material names. Is used when considering the absorption dependence in the energy range for the specified material.

Press **Apply** to save new settings.

AUTOCALIBRATION SETTINGS

Autocalibration Tab

The screenshot shows the 'Device Settings' dialog box with the 'Autocalibration' tab selected. The dialog has a blue title bar and a sidebar on the left with tabs: General, Thresholds, Energy calibration, Identify, and Autocalibration. The main area contains the following settings:

- Spectrum accumulation time, sec: 600
- First point:
 - Low channel: 45
 - Hight channel: 70
 - Energy, keV: 344.28
- Second point:
 - Low channel: 165
 - Hight channel: 250
 - Energy, keV: 1408.00
- Coefficient FWHM: 0.980
- Start accumulation button

At the bottom of the dialog are three buttons: OK, Cancel, and Apply.

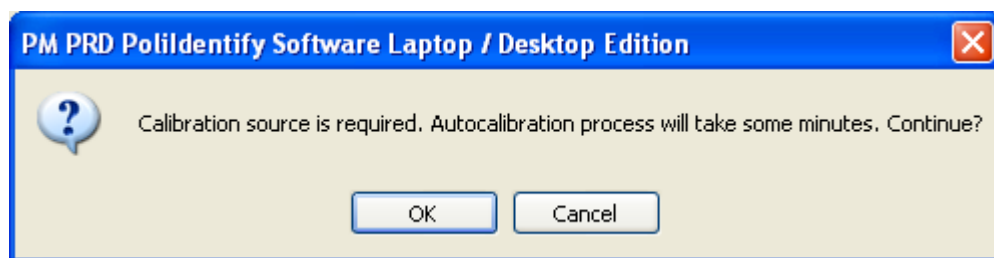
Loading of gamma channel in the process of spectrum accumulation is an important requirement for getting reliable spectrum. Over- or under-loading of gamma channel distorts it and leads to unreliable results.

The manufacturer recommends checking of gamma channel loading in the *Search & Measurement* mode before starting autocalibration by reference source.

The average count rate of the registered photon radiation impulses and the average count rate statistical error by scintillation detection block (SDB) are displayed in the *Gamma Channel* field of *Search & Measurement* mode. Place the instrument at such a distance to the tested object so that count rate by SDB is in the range between 300 and 400 cps.

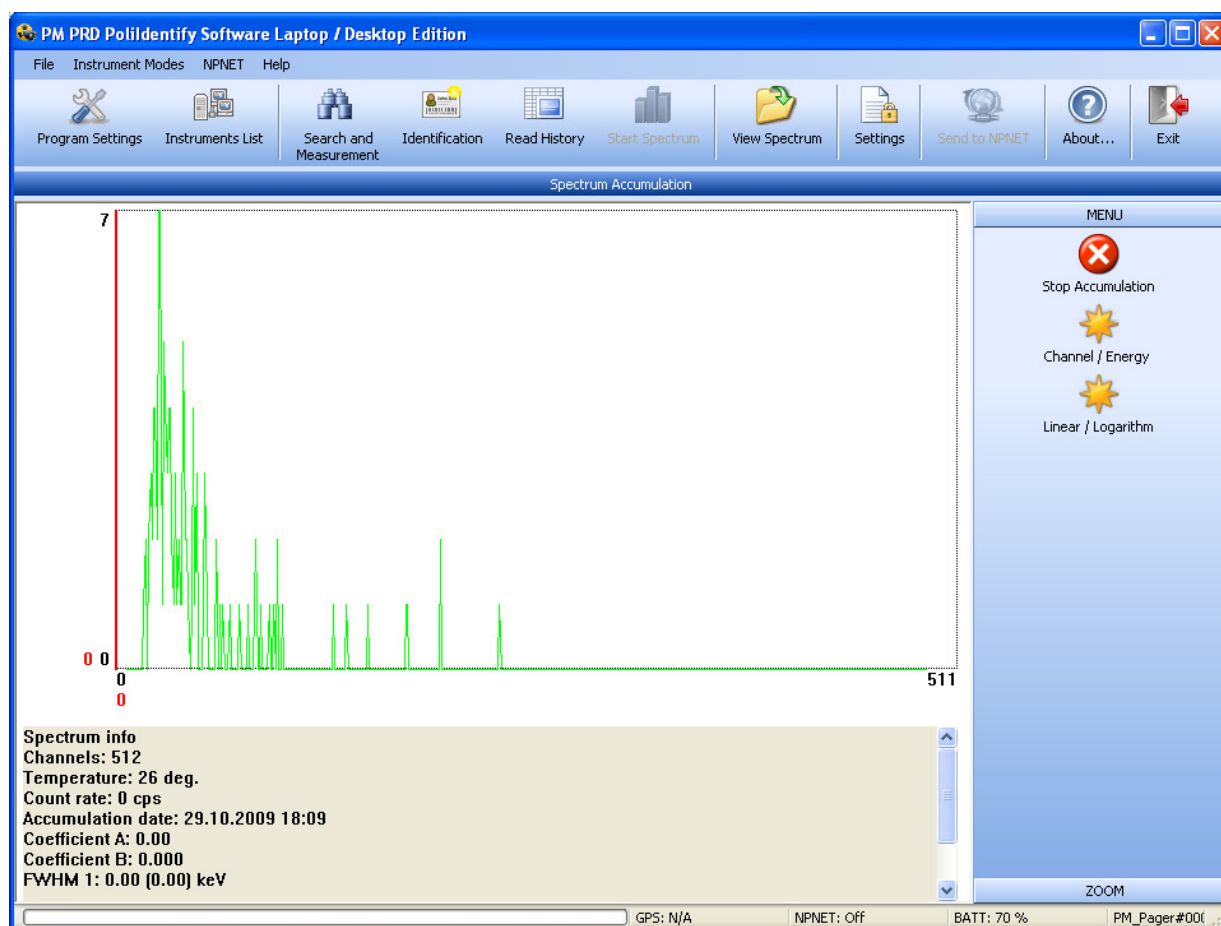
Switch the instrument to the *Advanced Instrument Settings mode/Autocalibration Tab* when the gamma channel is loaded as needed.

Software asks for confirmation if the *Start accumulation* command was clicked.

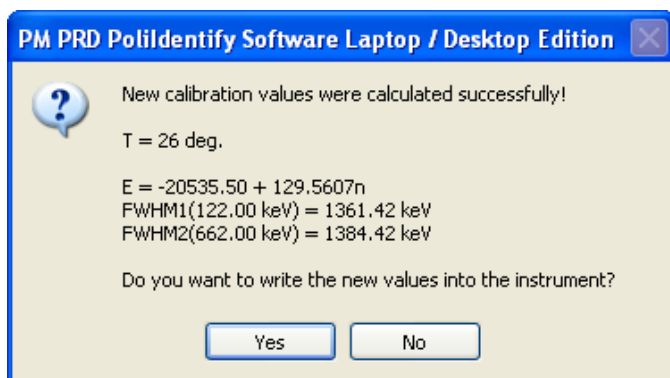


Program automatically enters *Start Spectrum* mode. When waiting period is over (several seconds), the progressive graph of the spectrum being accumulated will be displayed in the *Spectrum Accumulation* window.

Service information on the accumulated spectrum is displayed in the lower window part.



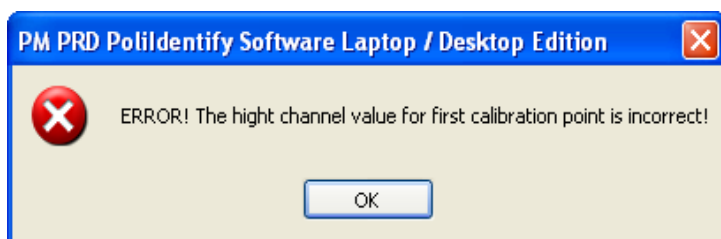
When spectrum accumulation time (set in the autocalibration mode) is over, program displays results of autocalibration. Press **OK** to enable their automatic saving to PC.

**Attention!**

Autocalibration results are automatically recorded into instrument memory.

To see stored results: being in **Advanced Instrument Settings** mode, press **Energy Calibration** tab.

If program displays error messages upon completion autocalibration on accumulated spectrum of the reference source, it means that peaks parameters set in the Identification mode don't correspond to peaks parameters of this reference source accumulated spectrum.



If so, reset autocalibration parameters. User takes peaks parameters values (further - autocalibration settings) by his/her own when the reference source spectrum was accumulated.

**Attention!**

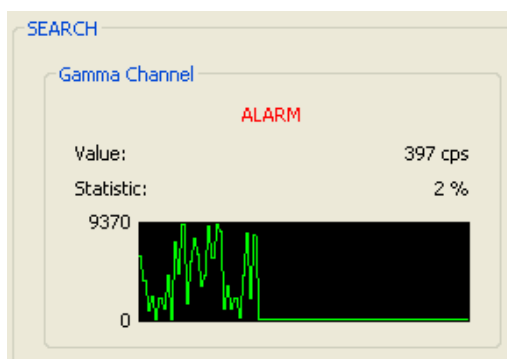
Manufacturer sets autocalibration values for Eu-152 reference spectrum. Below the method to record autocalibration settings is given for Eu-152 source. Use the same way to record autocalibration settings for any other reference source.

First of all accumulate spectrum of this reference source. Use the same way as stated in the **Spectrum Accumulation** chapter.

Loading of gamma channel in the process of spectrum accumulation is an important requirement for getting reliable spectrum. Over- or under-loading of gamma channel distorts it and leads to unreliable results.

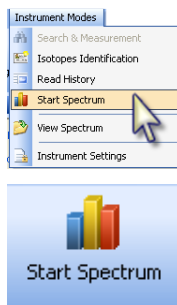
The manufacturer recommends checking of gamma channel loading in the **Search & Measurement** mode before switching the instrument into **Start Spectrum** mode.

The average count rate of the registered photon radiation impulses and the average count rate statistical error by scintillation detection block (SDB) are displayed in the **Gamma Channel** field of **Search & Measurement** mode. Place the instrument at such a distance to the tested object so that count rate by SDB is in the range between 300 and 400 cps.



Switch the instrument to the **Start Spectrum** mode when the gamma channel is loaded as needed.

Use one of the following ways* to switch instrument into **Start Spectrum** mode:

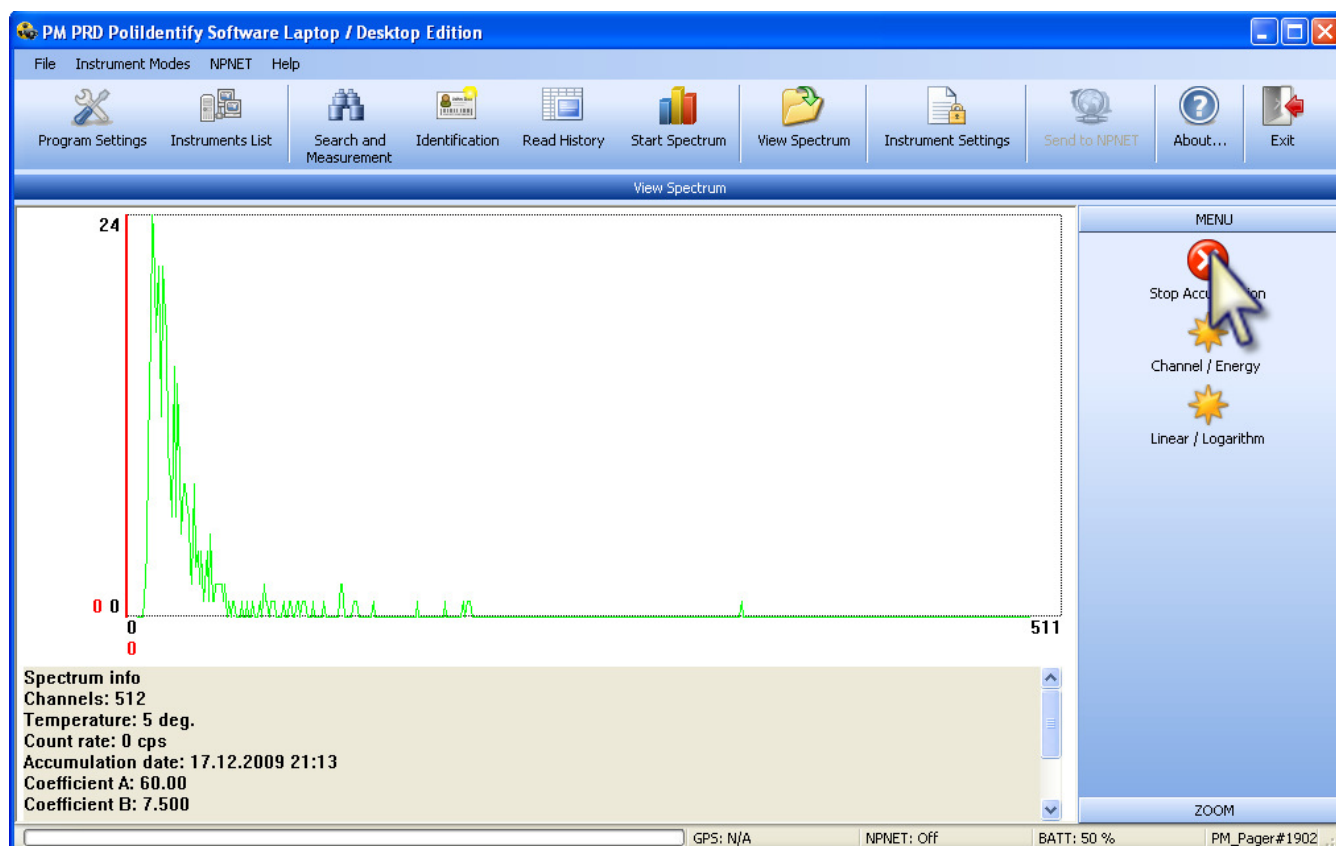


*Select **Instrument Modes** menu and click **Start Spectrum** command;

*Press this toolbar button.

When waiting period is over (several seconds), the progressive graph of the spectrum being accumulated will be displayed in the **Spectrum Accumulation** window.

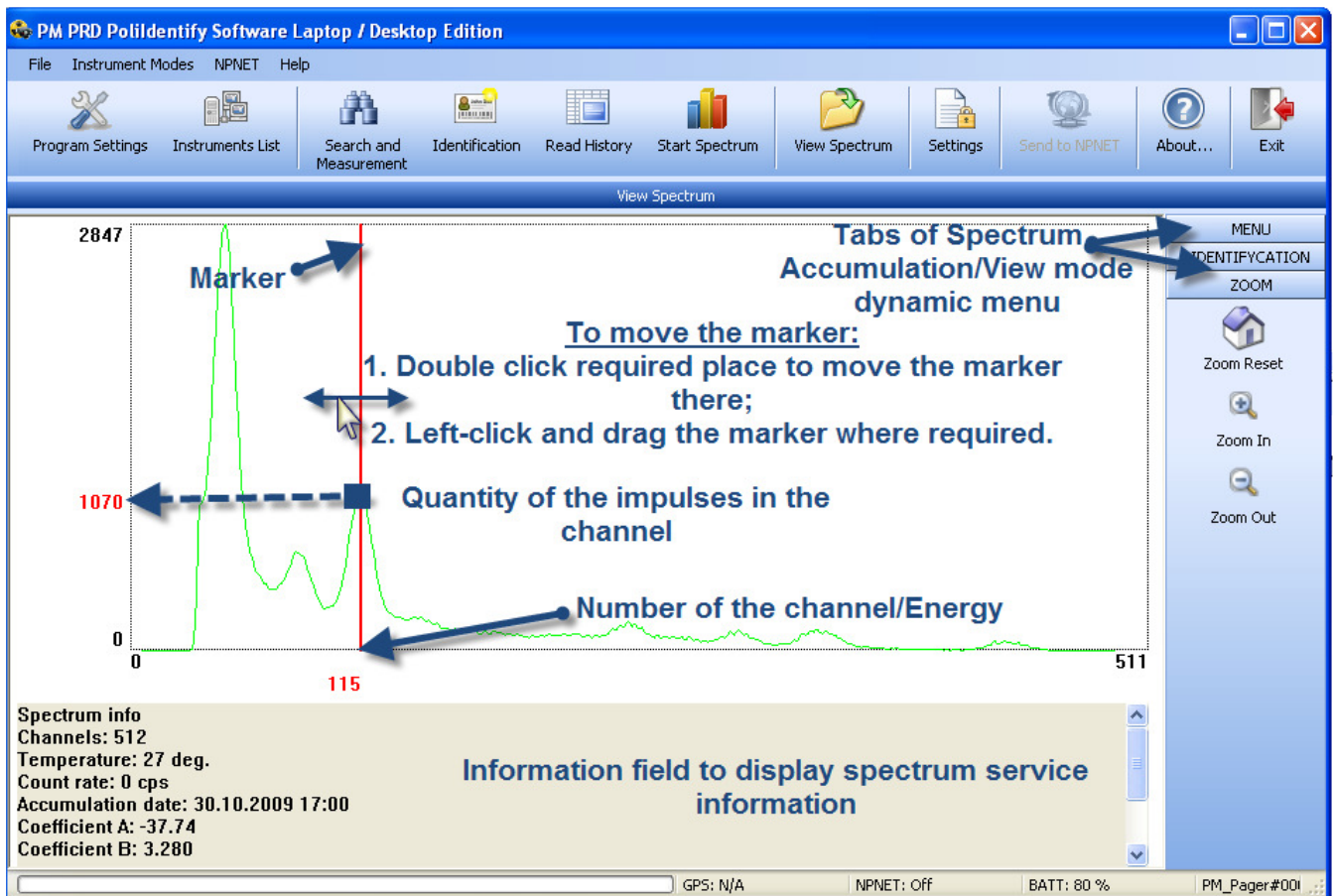
Service information on the accumulated spectrum is displayed in the lower window part.



Instrument accumulates spectrum by 512 channels. The capacity of each channel is 65536. It is necessary to accumulate not less than 10^4 impulses in the maximum count channel to get a good quality spectrum.

Besides, spectrum accumulation time can be determined visually according to sharpness of the PC-displayed peaks. If you see clearly distinguishable peaks on the graph, you can stop the spectrum accumulation process.

To stop the spectrum accumulation process, click *Stop Accumulation* command of the *Spectrum Accumulation* window dynamic menu. PC will display spectrum accumulated on the reference source.

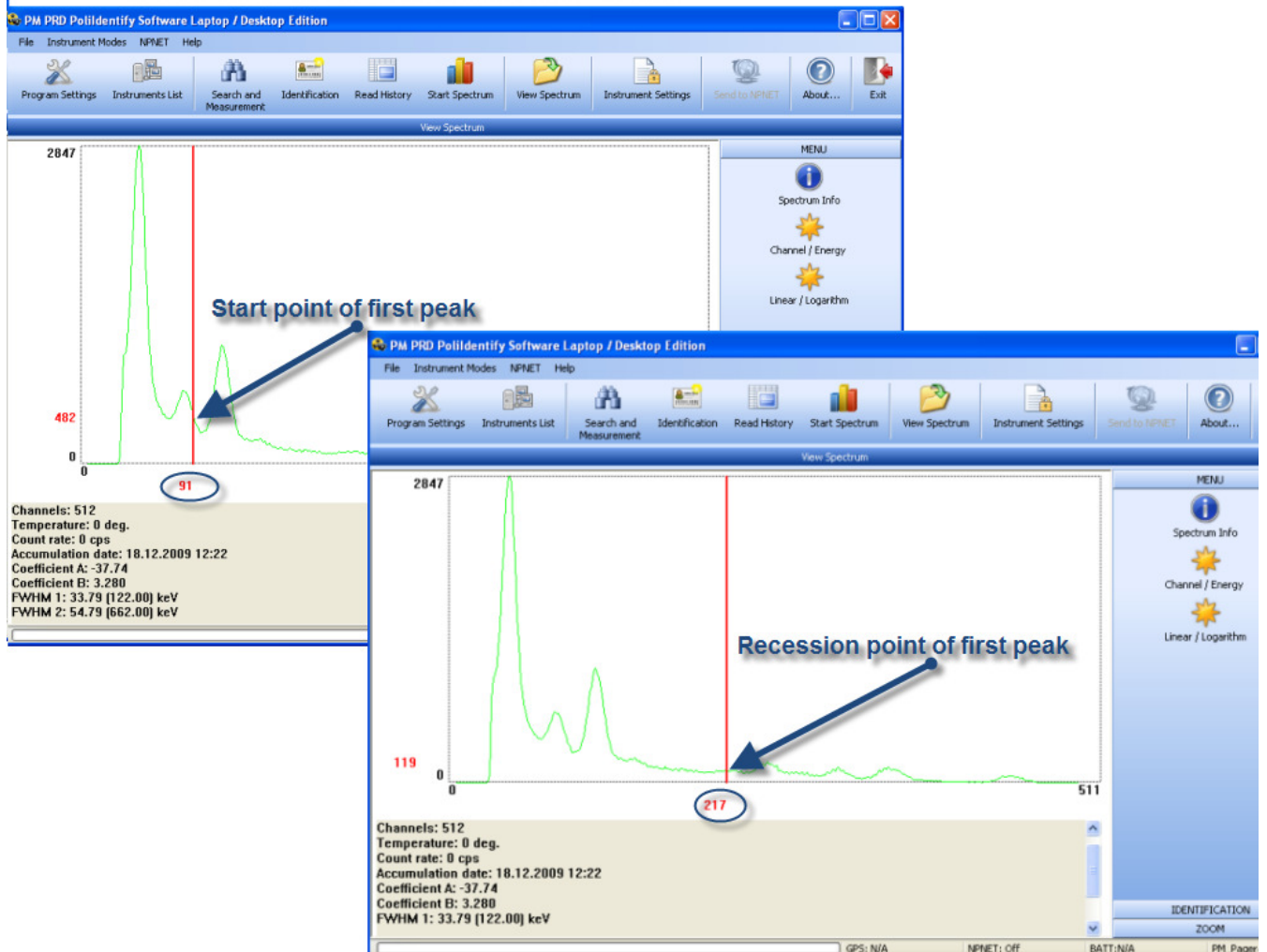


To process accumulated spectrum: select two the most distant peaks. Then mark lower and higher limit of two peaks: a point to the left of the inflection point and endpoint of peak recession.

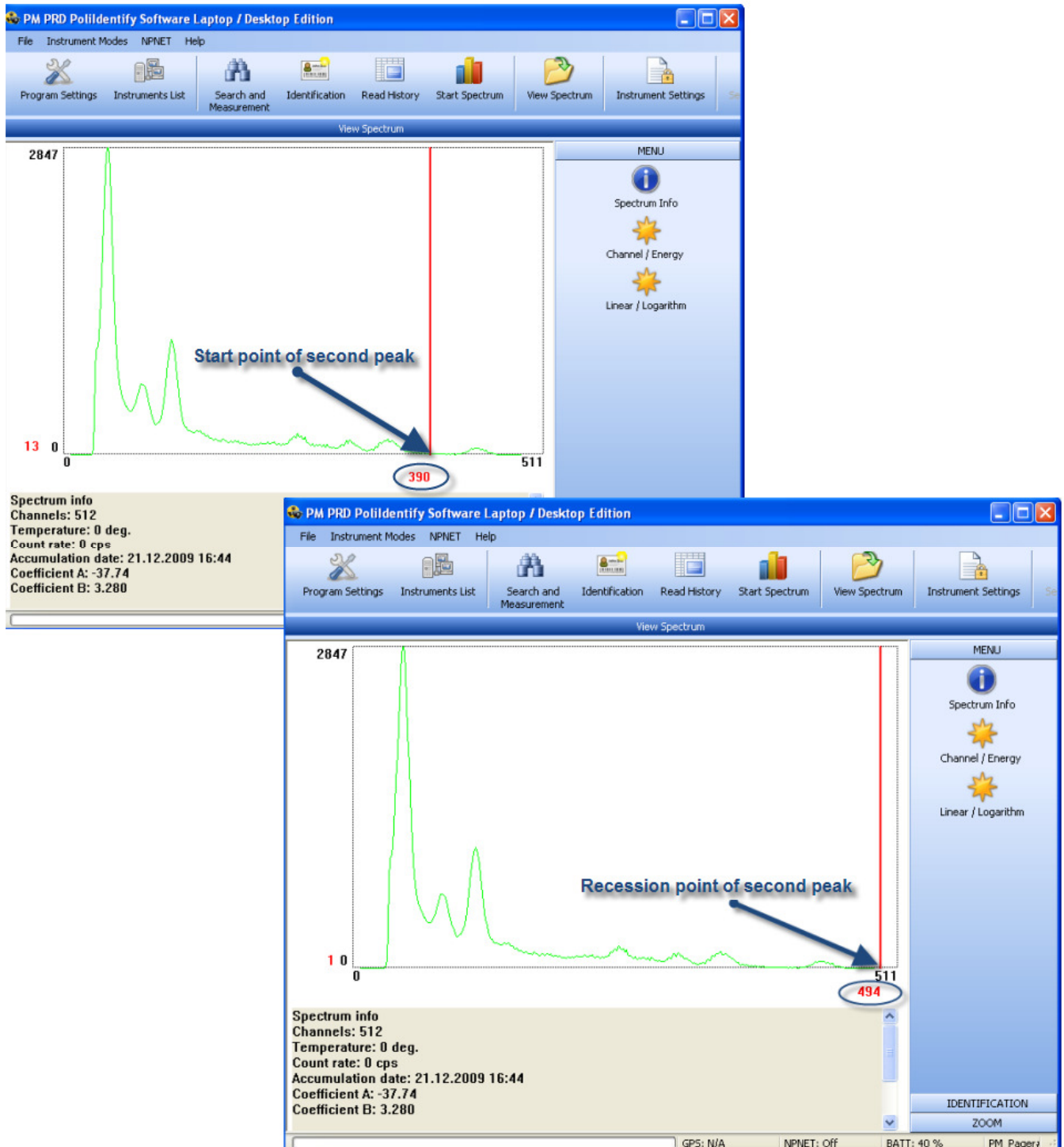
Observe the following recommendations when selecting these limits:

- Use peaks with good resolution only for autocalibration. Such peaks (singlets) consist of a single emission line. There are no adjacent peaks near them (otherwise the program can interpret another peak as a calibration one);
- The inflection points must be as low as possible. The Eu-152 lines with 344.28 and 1408 keV energies (as in our situation) meet these requirements. Besides, Na-22 isotope with 511 lines and 1274 keV energy can be used as calibration source as well.

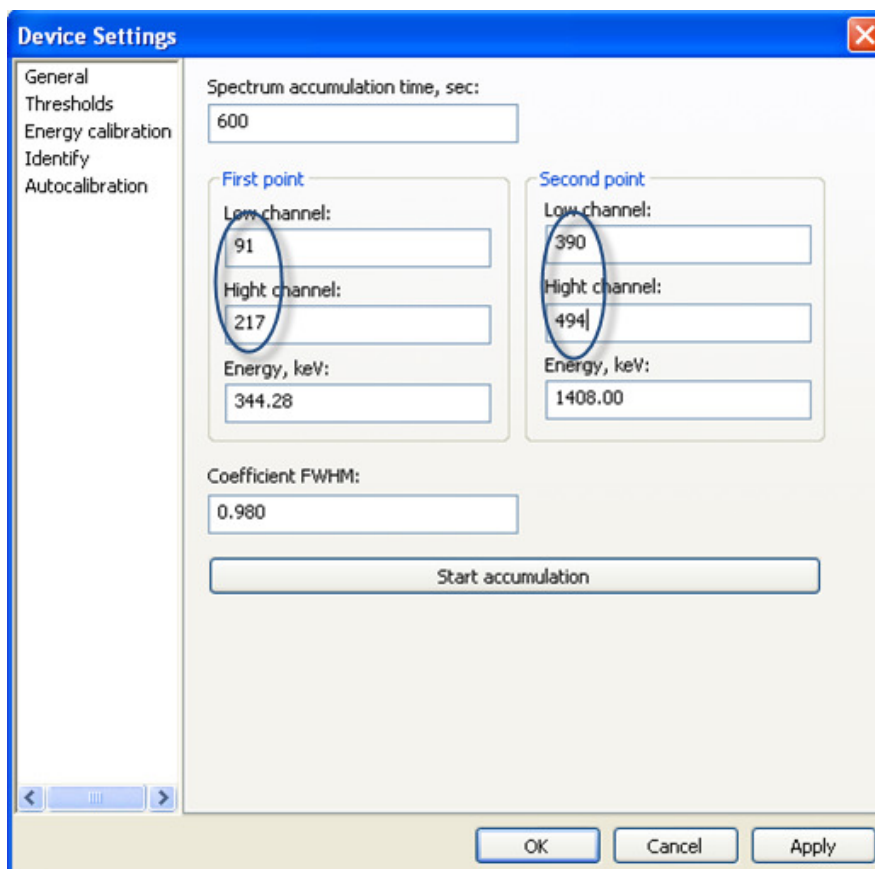
INTERVAL FOR FIRST PEAK



INTERVAL FOR SECOND PEAK



Then enter **Advanced Instrument Settings** mode and click **Autocalibration** tab. Record the following autocalibration mode settings:



- **Spectrum accumulation time, sec** – Recommended autocalibration time at count rate by SDB within 300-400 cps is no less than 300 sec. User can change this time. Note that doing so you increase measurement error. Polimaster recommends setting 600 sec.
- **First point. Low channel** – channel number of first peak start limit (73).
- **First point. High channel** – channel number of first peak recession point (98).
- **Second point. Low channel** – channel number of second peak start limit (399).
- **Second point. High channel** – channel number of second peak recession point (471).
- **Coefficient FWHM** – coefficient of peak width at half height, which is used to correct computed peak width at half height during autocalibration. This coefficient enables increasing peak width at half height if its value exceeds 1, or decreasing if coefficient value is less than 1.

Press **Apply** to save new settings. **All autocalibration settings will be automatically recorded to instrument memory.**

Then redo autocalibration by the same source. Accumulate spectrum one more time (see the beginning of **Autocalibration Settings** chapter).

APPENDIX A

Full Isotopes List of the Nuclide Library

Identified Isotopes

Name	Activity and error	Found peaks/ Peaks in the library	Channels centroid of the found peak	Notes
Th228	1.49E04 +/- 2.3E03Bq	3/3 peaks	(86, 758, 185)	-
Th232	1.31E04 +/- 2.1E03Bq	2/7 peaks	(86, 185)	-
Bg100	4.3E03 +/- 5.3E02Bq	1/1 peak	(44)	-

Uncertain or Very Uncertain Isotopes

Name	Activity and error	Found peaks/ Peaks in the library	Channels centroid of the found peak	Notes*
Ra226	5.91E03 +/- 2.1E03Bq	2/7 peaks	(115, 185)	uncertain 1),2),3),4)
Bi207	3.47E03 +/- 1.6E03Bq	1/2 peaks	(185)	uncertain 1)
Y88	6.83E03 +/- 3.1E03Bq	1/2 peaks	(288)	uncertain 5)
Eu152	5.97E03 +/- 2.9E03Bq	1/7 peaks	(115)	very uncertain 1),3),4)
Ir194	1.22E04 +/- 6.E03Bq	1/3 peaks	(115)	very uncertain 1),3),4)
Ba133	2.55E03 +/- 1.3E03Bq	1/1 peak	(115)	very uncertain 1),3),4)
Ir192	1.13E03 +/- 5.6E02Bq	1/5 peaks	(115)	very uncertain 1),3),4)
Pd103	7.2E06 +/- 3.5E06Bq	1/2 peaks	(115)	very uncertain 1),3),4)
Np237	4.41E03 +/- 2.2E03Bq	1/2 peaks	(115)	very uncertain 1),2),3),4)
I131	1.95E03 +/- 9.6E02Bq	1/2 peaks	(115)	very uncertain 1),2),3),4)
Pu239	2.79E08 +/- 1.4E08Bq	1/5 peaks	(115)	very uncertain 1),3),4),5)

*Note:

1) Responsible peak is assigned to more than one nuclide. Try longer measurement time to eventually find more peaks.

- 2) Responsible peak fits bad to library energy. Try to recalibrate and repeat measurement.
- 3) Responsible peak has very low statistics. Try longer measurement time to confirm.
- 4) Responsible peak is part of a multiplet. Try longer measurement time to eventually find more peaks.
- 5) Another important peak must be found. Try longer measurement time to eventually find more peaks.

Isotopes not Found

Name	Activity
Ce139	<4.3E03Bq
Co57	<3.1E03Bq
Co60	<5.E03Bq
Cs137	<7.7E03Bq
Ga67	<1.7E04Bq
I123	<3.6E03Bq
In111	<4.3E03Bq
K40	<1.2E05Bq
Mn54	<6.4E03Bq
Na22	<3.E03Bq
Pu241	<9.5E08Bq
Se75	<5.4E03Bq
Sn113	<6.1E03Bq
Tc99	<3.6E03Bq
Ti44	<2.9E03Bq
Tl201	<3.8E04Bq
U233	<3.4E03Bq
U235	<6.2E03Bq
U238	<1.4E06Bq
Zn65	<8.9E03Bq

Thank You for choosing

Polimaster!