

Gamma Spectrometer

Quick-start Guide

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A – Preparations

1 – Unpacking and setting up

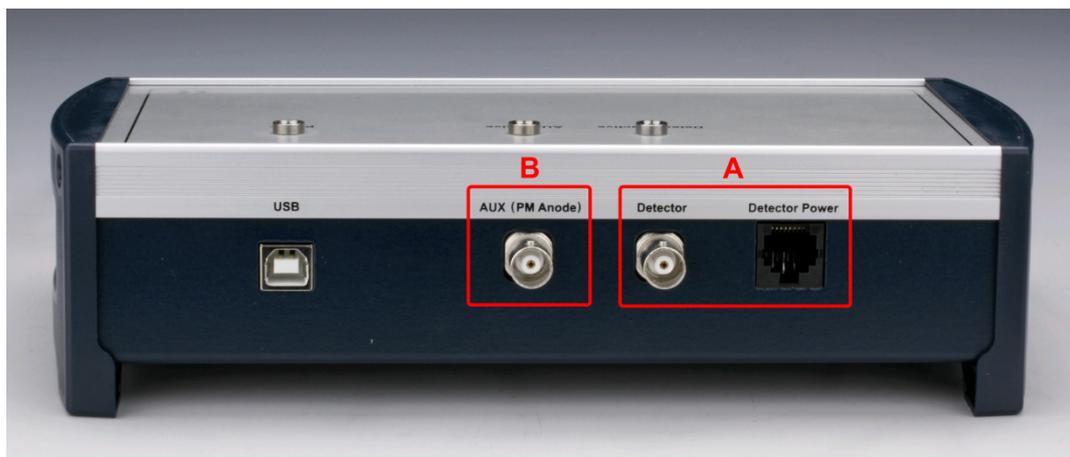
Unpack the equipment and check that it is complete:

The multichannel analyzer (518000) comes with a USB cable, a CD-ROM, this Quick Start Guide and a more detailed manual.

The scintillation detector (518500) comes with a signal cable with BNC connector, a control cable with RJ45 connectors and a brief documentation.

Connect the **scintillation detector 518500** to the multichannel analyzer with two cables. Use the *Detector* and *Detector Power* connectors – shown as "A" in the photo below.

Note: Always connect the detector's two cables to the MCA before the USB cable is connected to the PC. Upon completion of the measurements: Remove the USB connection first, then the cables to the detector.



If a **traditional photomultiplier tube** is used for a detector instead of 5185.00, the signal goes to the *Aux (PM Anode)* connector – "B" in the photo. High voltage bias for the photomultiplier tube must come from an external supply.

2 – Software

All necessary software will be available on the accompanying CD.

The driver for multichannel analyzer is open source software: libusb-win32. If there is a need for updating the driver, it can be found at <http://libusb-win32.sourceforge.net>.

The program itself is written specifically for Frederiksen's multichannel analyzer. If we send out major updates, there will be information about this in our newsletter. Sign up on www.frederiksen.eu.

B – Installation of software

1 – Preparations for Windows 8 and 10

The USB driver for the multichannel analyser is not digitally “signed” which means that Windows 8 and 10 normally will reject to install it. To overrule this policy the following procedure must be followed:

1. Go to the Start menu or the Power options menu and find the entry *Restart*. Click this entry **while holding down the *shift* key**.
2. After the restart, new options appear. Choose the *Troubleshoot* option.
3. Next selection: *Advanced options*.
4. Next selection: *Startup Settings*. This will display a screen telling that one more restart is necessary. Click *Restart*.
5. During the restart, a list with options is presented. These are activated by pressing the function keys. Press the F7 key on the keyboard.
6. When the PC has restarted you must log on as administrator.
7. Now the driver can be installed by following the instructions in paragraph 2 below.

Warnings about the un-signed driver will still be issued. Chose to install it anyway.

The driver signature enforcement is only disabled until the PC reboots.

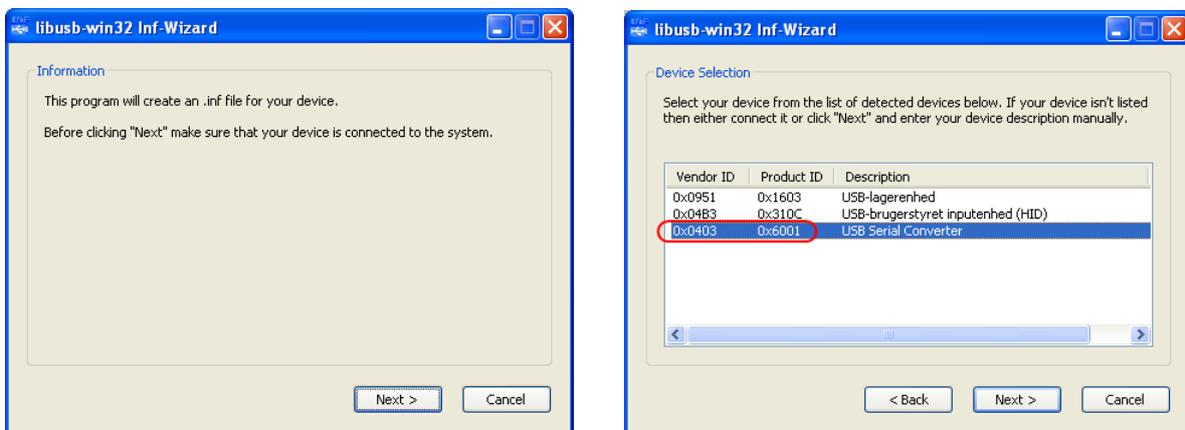
2 – Driver installation

Connect the multichannel analyzer to a USB port on the PC. Wait about half a minute.

If the usual Plug'n'Play installation procedure is carried out automatically – ignore it.

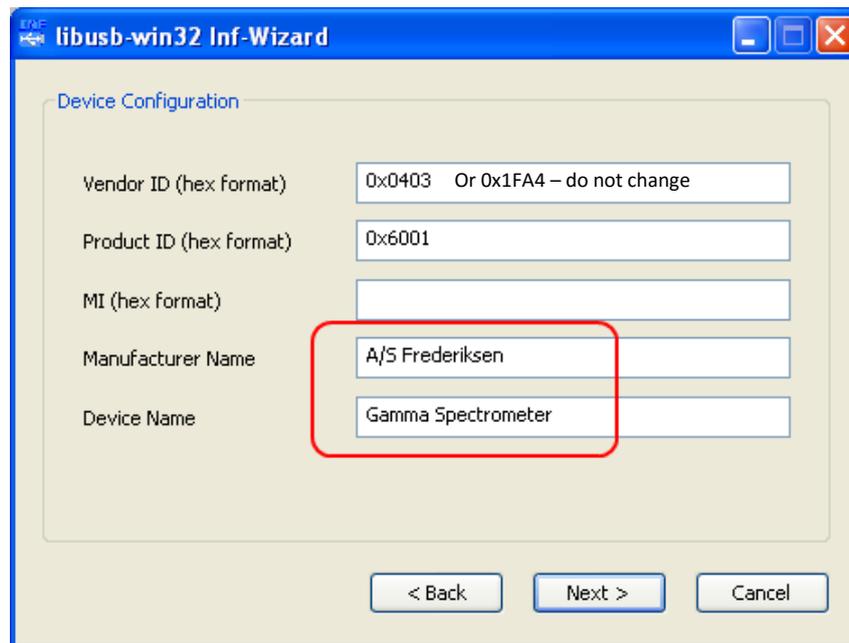
If the automatic installation starts asking questions – shut it down.

The CD contains a shortcut to the *USB Install* program. Double-click to start. From the first screen view you just click *Next*.



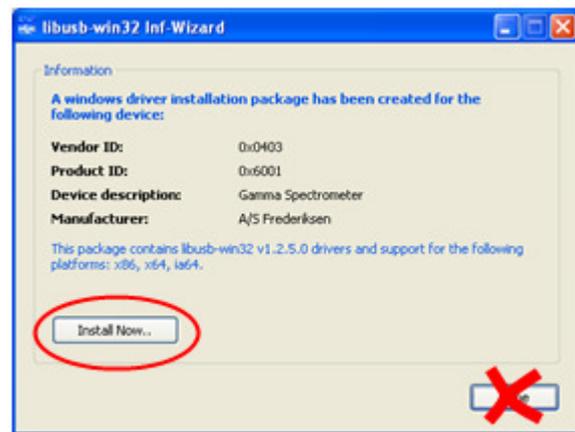
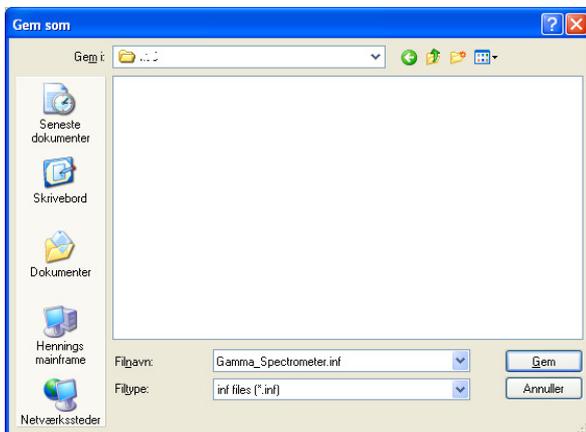
In the next dialog box, highlight the line that has **Vendor ID 0x0403 or 0x1FA4** and **Product ID 0x6001**, before clicking *Next*.

Fill out the next dialog box as follows and click *Next*:

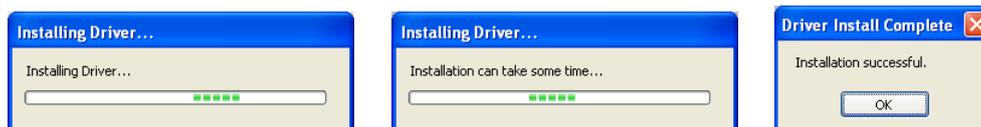


Now the installation will produce a so-called INF file that we do not actually need. Specify a location for it; it is OK to delete it again afterwards.

On the next screen, select *Install Now ...* (do **not** click *Done!*).



Wait for these boxes:



Now, the driver installation process is completed.

3 – Installation of GaSp

The CD contains the program itself, consisting of the two files:

GaSp.exe
FMCA1.dll

Copy these two files manually to an appropriate folder using Windows Explorer.

On a **Windows 7** PC this could be

C:\Program files(x86)\Frederiksen\GaSp

Likewise on a **Windows XP** PC:

C:\Program files\Frederiksen\GaSp

Copy a shortcut to GaSp.exe to the desktop:

Right-click GaSp.exe, select *Copy*
Right-click the desktop, select *Paste Shortcut*

4 – GaSp without hardware

Spectra can be saved as files to be displayed or analysed later. This can be done on another PC that doesn't need to have the USB driver installed.

For this, only the program file GaSp.exe itself is necessary on the PC.

(Older versions than 1.25 will freeze if they are run without the file FMCA1.dll.)

As long as no spectrum is loaded, the status field of the program will indicate that a DLL file is missing or that the driver has not been installed. This can be ignored.

C – Tests

1 – Starting the program

First, connect the detector to the multichannel analyzer, and then the MCA to the PC.

Start the program by double clicking on the shortcut you created during installation.

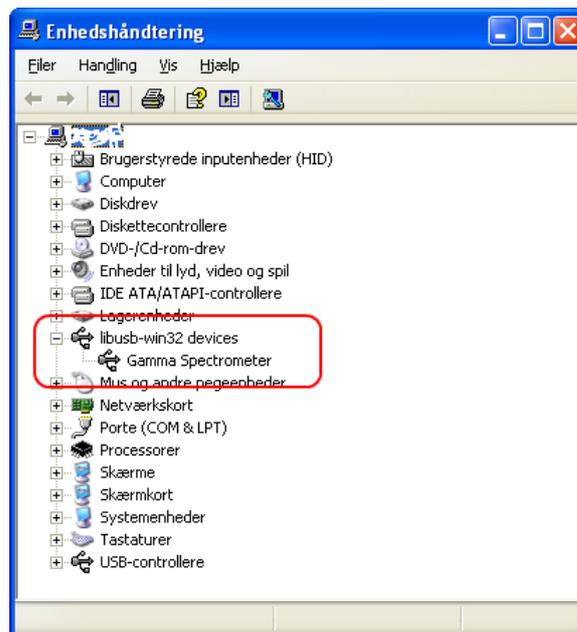
Make sure that the multichannel analyzer is detected by the program – it will show in the status bar:



If the program is not in contact with multichannel, there is probably a driver problem.

Open the *Windows Control Panel / System / Hardware / Device Manager*.

This device should appear as shown below.



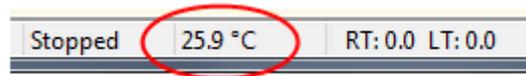
Try if necessary to install the driver once again as described previously.

2 – Checking the detector connection

- **If you use the scintillation detector 518500**

Check the communication between the detector and multichannel analyzer:

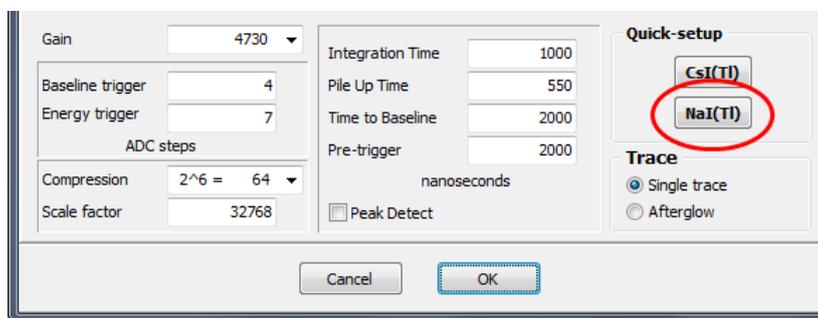
See the status bar - detector temperature must be shown (and look reasonable):



- **If you use a traditional photomultiplier tub with a NaI crystal**

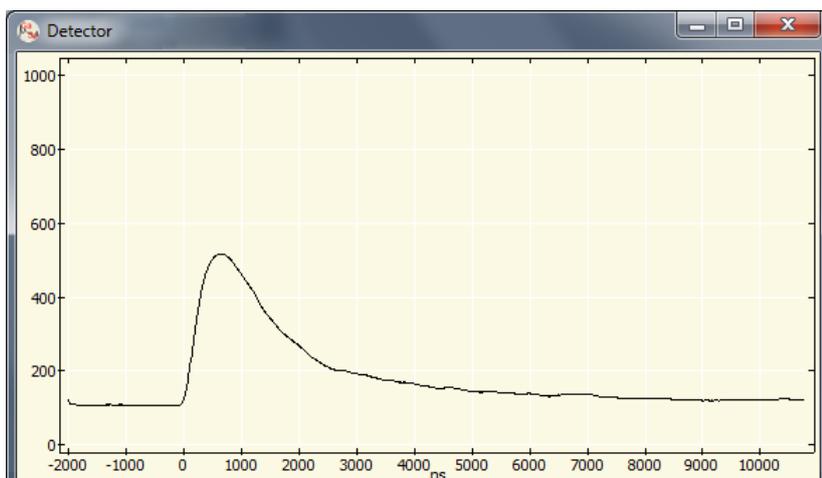
Select the menu item *Hardware / Detector*.

Set parameters as shown by clicking the button *NaI(Tl)*:

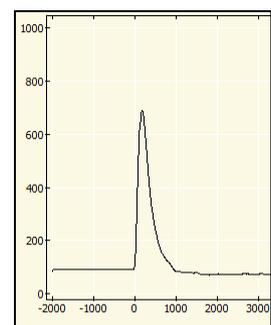


- **In both cases**

The menu item *Hardware / Detector* shows at the top the signal as received from the detector. The image below shows a rather large pulse from a CsI-detector. Pulses from a NaI detector are narrower (faster). A “curly” curve of little noise pulses is also OK for now. A completely straight line at the zero level means trouble.



CsI

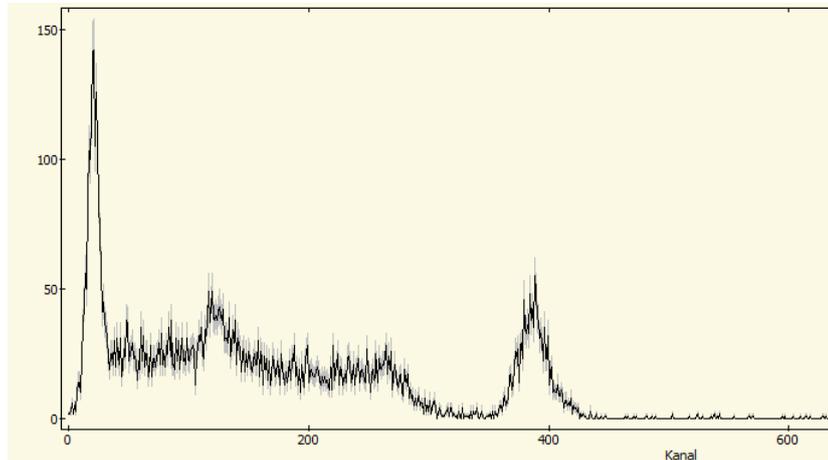


NaI

3 – Test with a source

Place a Cs-137 source about 1 cm from the detector.

Click *Start* at the upper left corner in the main program. After a short while, a spectrum like the one below should appear. (The spectrum in this image is the result of measuring for 20 seconds.)



Now, you have demonstrated that you can acquire a spectrum with your new equipment – congratulations!

You will first obtain the full benefit of the equipment when you get to know it a little better. In the manual for the MCA, the equipment and the software are described in detail. It is for instance explained how an energy calibration is carried out – why a spectrum like the above looks the way it does – how a long-term experiment is best set up – and much more.

Note: The program and the documentation will be updated from time to time with corrections and eventually new features.

We strongly recommend that you subscribe to our mailing list for program updates.

Send a mail to info@frederiksen.eu

We will send you a *link* to a ZIP file with the newest version – in other words, no large files are send via this mailing list. The update frequency will be very low.