DP5 QUICK START GUIDE

The Amptek DP5 Digital Pulse Processor is strictly an OEM product. Please refer to the DP5 documentation for information on the use and hardware setup of the DP5. This Quick Start only describes the software setup using a USB connection. The manner in which the DP5 is both powered and connected to the PC's USB port varies depending on whether the DP5 is bought stand-alone, or with a PC5. Those connections are not addressed here.

NOTE:

In order to be compatible with Windows 7 64-bit, a new USB driver must be used (WINUSB). If you are an OEM and have written custom software using the DPPAPI with the old APAUSB driver and you statically linked the dll, you will have to re-compile your software with the new dll. Dynamically linked software does not require a re-compile, only copying the new dll into your installation. No source code changes are necessary in either case.

Software Installation

1. Install the WINUSB Driver. Please see the "WINUSB Driver Installation Instructions" for this procedure.
2. Install he ADMCA display and acquisition software. Locate the directory called "ADMCA" on the Amptek Installation CD and copy the entire directory onto your computer. In that directory is the "ADMCA.exe" file. Open this file to start the software. You can right-click on the ADMCA.exe file and create a shortcut which can be placed on your desktop for easy access.

Quick Use of the DP5

1. Connect the DP5 to the PC and apply power.
2. Launch the ADMCA software by opening the ADMCA.exe file.
3. When the "Starting ADMCA" box appears as in figure 2, select DP5/X-123SDD and click on "Connect." The DP5 unit should now be connected to the software. To verify this, confirm that a serial number for the DP5 is shown in the top right corner of the software and that the USB symbol located at the bottom right corner of the software is green.

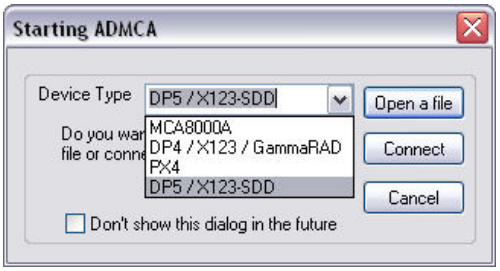

Figure 1: Starting ADMCA

4. Now that the DP5 is connected the proper configuration must be selected for the detector. The ADMCA software includes configurations for most Amptek detectors. These configurations are identified by the detector material, dimensions, and cooler type.
   - NOTE: The DP5 remembers the last configuration, so when powering the system for the first time and clicking Connect, the factory configuration is loaded. This is the same configuration that is displayed on the test sheet shipped with the detector.
5. To select a configuration select "DPP Setup" under the "DPP" dropdown list in the software or by clicking the "acquisition setup" button on the toolbar. The dialog box shown in Figure 3 will appear. If using an Amptek detector, the configurations can be selected through the dropdown menu labeled "Read Amptek Detector Configuration."
6. Once the correct configuration is selected from the dropdown menu the indented grey area above the dropdown menu should read (for example) "Loaded SDD 7mm2/450um 2-Stage Cooler configuration." Click "Show Current Configuration" to view the settings. A box will appear with the settings. Click OK to exit the box.
7. To apply the selected configuration click the "Apply" button. Then select the "OK" button to exit this dialog box.

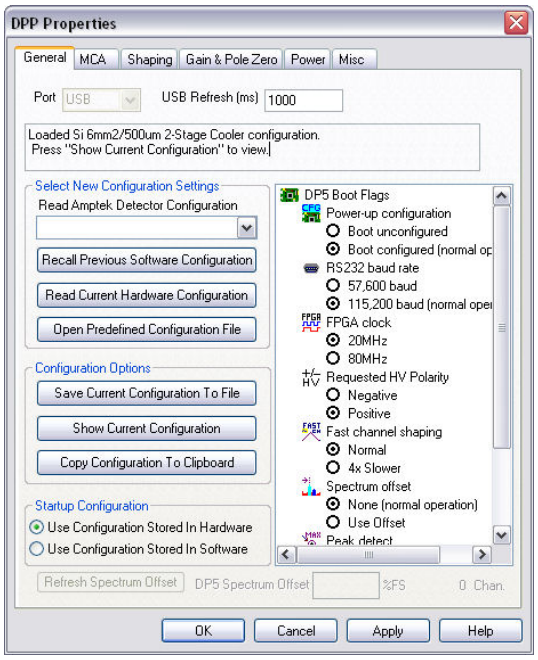

Figure 2: Properties dialog box.

8. Now that the DP5 has loaded the appropriate configuration for that detector, an acquisition can be started. Place a source in front of the detector. To start an acquisition, press the space bar. The space bar will also stop an acquisition. It may take the detector

a few minutes to stabilize, so if the acquisition does not look correct wait a few minutes and then press the "A" key on the keyboard to clear the acquisition and begin a new one. It can take up to 2 minutes for an Amptek detector to stabilize after a configuration has been sent.

- Once the detector has stabilized adjust some of the thresholds which prevent low-end noise and other unwanted counts from affecting the spectrum. This can be done automatically by the software by clicking the "Tune Slow/Fast" button on the toolbar. This must be done with no source in front of the detector.

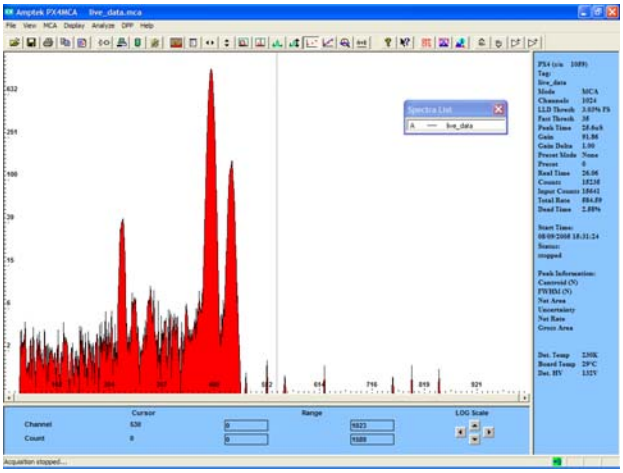

Figure 3: Acquisition spectrum for an ^{55}Fe source.

9. A common adjustment is to change the gain of the DP5. Changing the gain changes the full scale energy range. For example, a gain of 100 may correspond to a full scale energy range of 15 keV, whereas a gain of 50 will have a 30 keV full scale. This can be done in the "Gain & Pole Zero" tab of the DPP properties dialog box or by using the gain buttons on the toolbar. It is necessary to readjust the thresholds whenever the gain is changed. This can be done automatically as explained in the previous step. For more information on gain and calibrating the channel scale to energy please see the document "How to Change the Full Scale Energy Range and Calibration" located on the CD in the "Documentation\Application Notes and FAQs" directory.

Notes and Troubleshooting:

- By default, the software accumulates the counts (MCA mode). During set-up it may be convenient to use "DELTA" mode, where counts are not integrated but are updated every second (i.e. only one second's worth of data are displayed every second). Click the toolbar icon marked "MCA/DELTA Mode" to toggle between DELTA and MCA mode.
- If no spectrum appears, check that the system is acquiring data. The "Status" on the right hand Info Panel should read "acquiring."
- Sometimes no spectrum will appear if pile-up-rejection (PUR) is enabled and the Fast Threshold is set improperly (in the Properties-Shaping tab). Turn PUR off and check if the spectrum appears. If it does, then the Fast Threshold needs to be set correctly as described below.
- The Fast and Slow Thresholds must be adjusted either automatically or manually. To automatically set the thresholds, start an acquisition with no source. Then click the "Tune Slow/Fast" button on the toolbar. To manually adjust the thresholds, first turn off PUR as described above. Then click the cursor to channel 1 and press F8. This will set the Slow Threshold (LLD) to channel 1. This will show the noise of the system. Click the cursor just to the right of the noise (where noise counts stop) and press F8. Press the "A" key to clear. There should be no noise counts accumulating. Put the device into "DELTA" mode by clicking the "Delta" button on the toolbar. Open the DPP properties and go to the Shaping page. Adjust the Fast Threshold until you get roughly 5 to 20 Input Counts per second. Now turn on PUR and click OK. Click the "Delta" button to get back to normal MCA mode and put the source back in front of the detector. The Input Counts should slightly exceed the Counts.
- It is important for the input offset to be tuned correctly and that the correct polarity is set for the input. Open the DPP Properties and click on the "Gain & Pole Zero" tab. Set the input polarity appropriately (positive for Amptek Si-PIN/CdTe, negative for Amptek SDD) and click the "Tune Input Offset" button. Then click "Apply" and then "OK."
- If problems persist, there may be a communication or configuration problem. Unplug the DP5 USB cable and whatever powers the unit and close the software. Then open the software, plug in the USB cable, and apply power. In the bottom left-hand corner of the software you should see a 1 Detected for the USB connection. Once you see this, click on Connect. Then go to the DPP Properties page and reload the appropriate default configuration as discussed above and try the acquisition again.
- Always use a single point earth ground. The power supplies in many laptop computers inject large ground currents. Isolate these grounds. A 3:2 prong plug is a powerful tool for isolating grounds but make certain that some point is tied to earth ground.
- If the unit does communicate but still no spectrum is seen, take an acquisition for 30 seconds. It does not matter is no spectrum appears. Then go to the File menu and select Save As. Save the .mca file and email it to sales@amptek.com with a description of the setup and the problem.