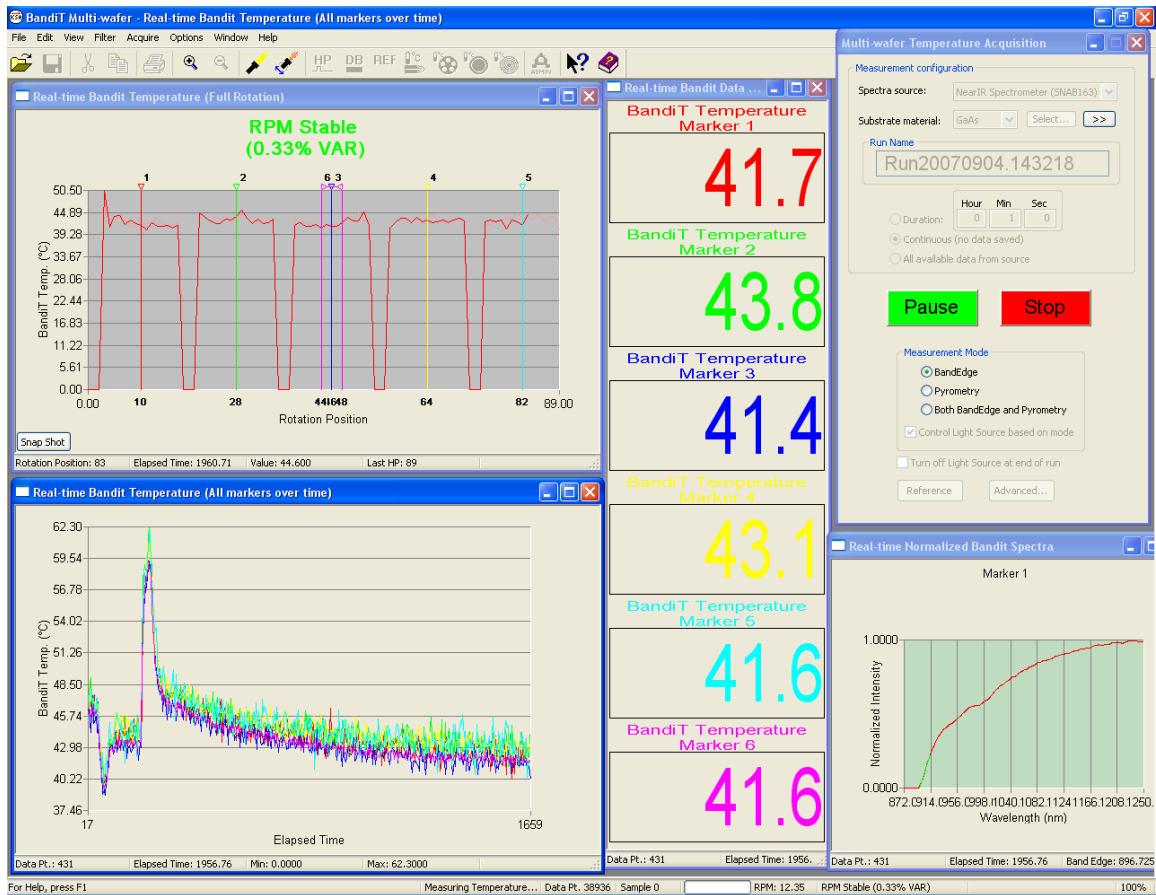


Installing or Re-Installing the kSA BandiT Software on Windows 10



k-Space Associates, Inc.

2182 Bishop Circle East, Dexter, MI 48130 U.S.A.

(734) 426-7977 www.k-space.com requestinfo@k-space.com



k-Space Associates, Inc., 2182 Bishop Circle East, Dexter, MI 48130 USA
(734) 426-7977 • requestinfo@k-space.com • www.k-space.com

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k-Space Associates, Inc.
2182 Bishop Circle East
Dexter, MI 48130
USA

Tel. (734) 426-7977
Fax (734) 426-7955

Email: requestinfo@k-space.com
Web: www.k-space.com



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1 Background

This document describes the procedure for installing/re-installing the **kSA BandiT** software application and for configuring several initial settings after the installation is complete. Note that these procedures assume that you are installing the **kSA BandiT** software on a computer running the Windows 10 operating system.

Your k-Space engineer will set up the software during the installation and setup of the **kSA BandiT** system. However, if you need to set up a new computer or update an existing one, this document will help you with that process.



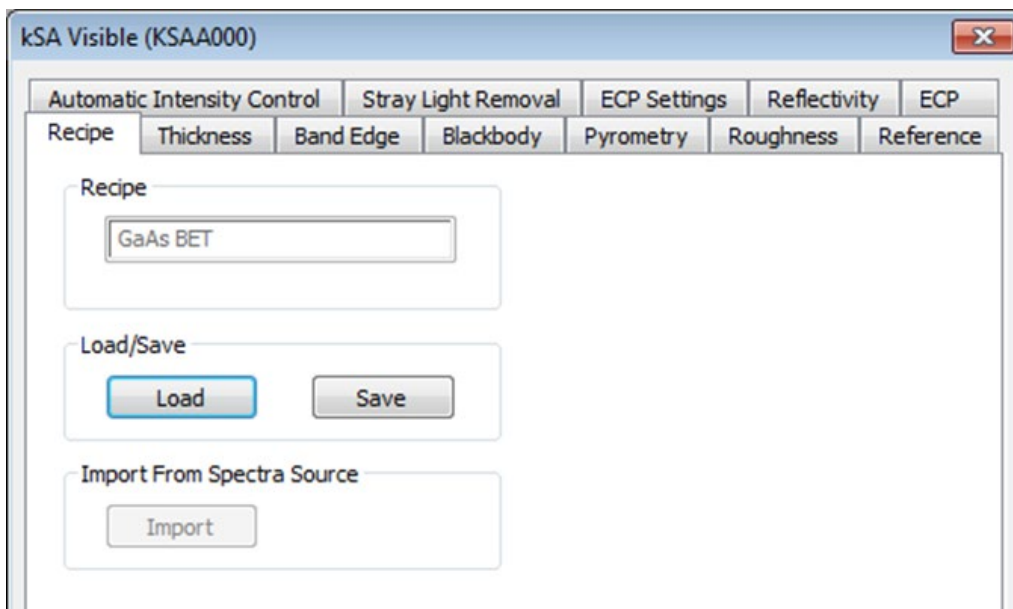
2 Saving Settings and Files from an Old Computer

If you are installing the **kSA BandiT** software application for the first time, you will not need to complete the steps in this chapter. However, if you are re-installing the software, we recommend that you save several settings from your current **kSA BandiT** application, as described in this chapter.

2.1 Temperature acquisition settings

Save the temperature acquisition recipe and make note of the substrate material, as follows.

1. Open the **kSA BandiT** application.
2. Choose **Acquire / BandiT Temperature** and click the **Config** button in the Spectra Source section.
3. Click the **Recipe** tab, and then click the **Save** button.



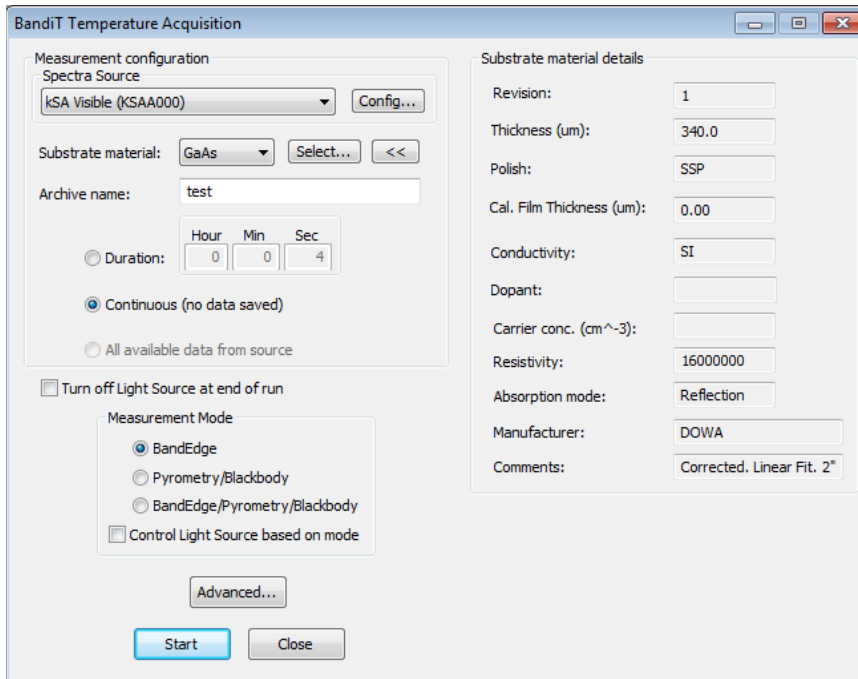
4. In the Save As dialog, enter a name for the recipe file, and then click the **Save** button.

All k-Space applications use recipe files to store the system's setup information, including band edge temperature, blackbody temperature, etc. By default, the application saves these files in the application's **Recipes** folder (typically **C:\Users\<User_Name>\Documents\kSA\kSA BandiT\Recipes**, where <User_Name> represents the username for the person logged in to the system).

5. Click OK to return to the BandiT Temperature Acquisition window.



- Note the item selected in the **Substrate material** field. Click the **Details** >> button to view detailed information about the substrate material.

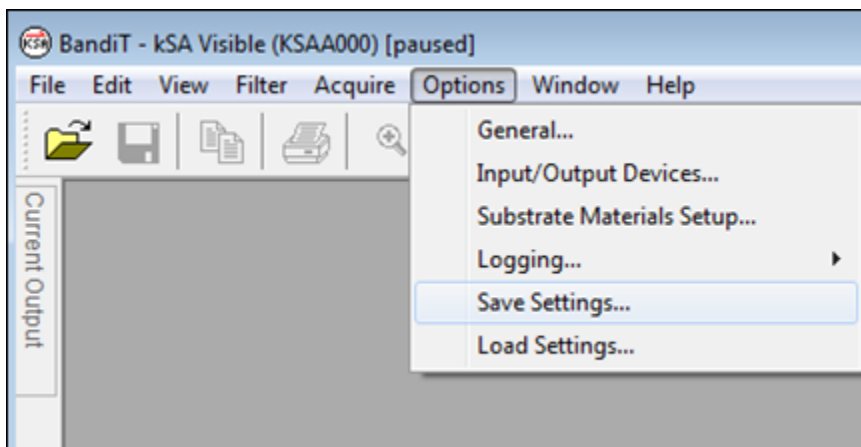


2.2 General options

Save the general settings for the application.

- Choose **Options / Save Settings**.
- In the Browse for personality file dialog, enter a name for the file, and then click the **Save** button.

The application creates a **.ksaxml** file that contains the kSA BandiT settings.

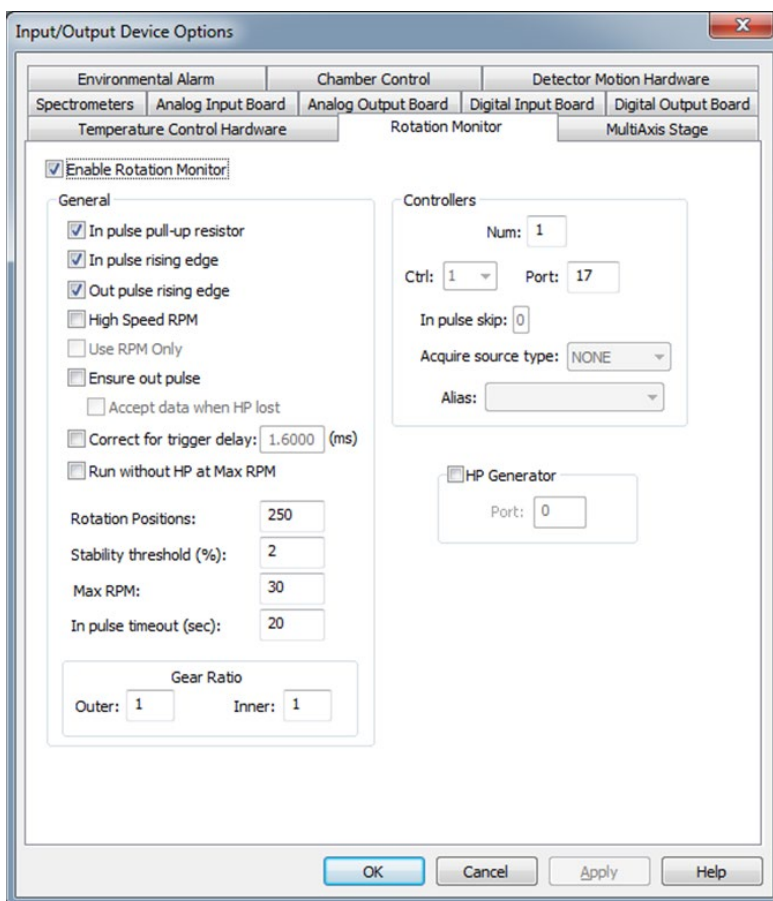




2.3 I/O Devices

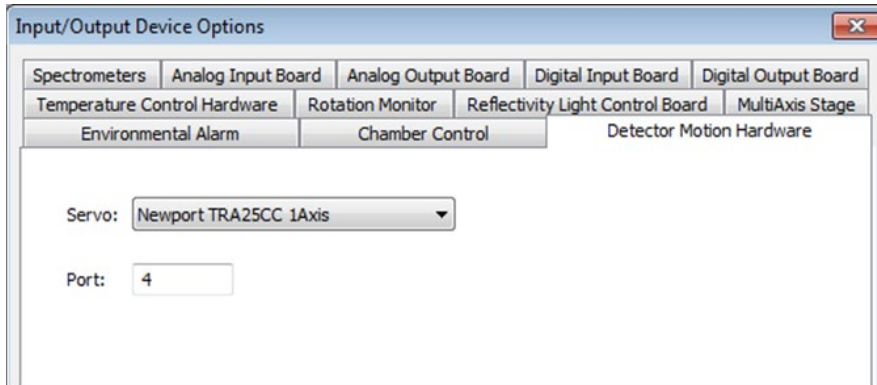
In general, when you save your settings as described in the General Options section above, the **.ksaxml** file will contain all necessary **kSA BandiT** settings. However, you may want to review and/or capture screenshots of some of your current settings. Following are examples of settings you may want to review.

1. Choose **Options / Input/Output Devices**.
2. If applicable for your **kSA BandiT** configuration, click the **Rotation Monitor** tab and take a screenshot using your preferred screen-capture application.
3. Save the screenshot in a location that is easily accessible.

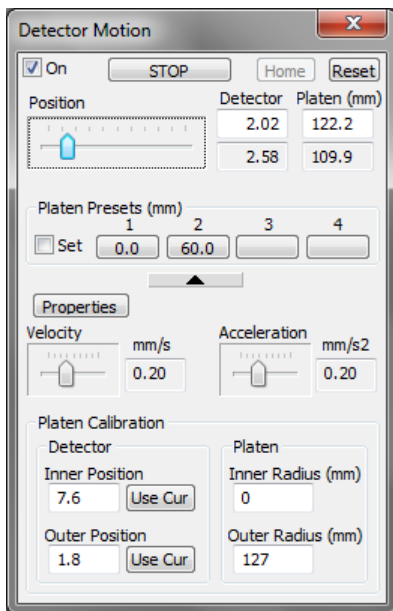




4. If applicable for your **kSA BandiT** configuration, click the **Detector Motion Hardware** tab, take a screenshot using your preferred screen-capture application, and save the screenshot in a location that is easily accessible.



5. If applicable for your **kSA BandiT** configuration, choose **View / Detector Motion**, take a screenshot using your preferred screen-capture application, and save the screenshot in a location that is easily accessible. Be sure that the screenshot includes the platen calibration settings.





2.4 Spectrometer configuration files

We recommend that you save a copy of the following data files.

- **Spectrometer setup files:** These are stored in a subfolder that includes the spectrometer's serial number in the name. This is of the form **SNxx nnnn**, where **xx** is either **AB** for NIR units, **AA** for vis units, or **IR** for cooled NIR units, and **nnnn** is the spectrometer's serial number.

For example, the subfolder for the SNAB0672 spectrometer would be named:

C:\Program Files (x86)\kSA\kSA BandiT\PROGRAM\Spectrometers\SNAB0672

Be sure to copy the entire contents of the folder.

- **Spectrometer's dark background file:** The file is named **Dark Background (SNxx nnnn).kdt**, and it is stored in the **Personal** subfolder, typically located in the following folder.

C:\Users\<User_Name>\Documents\kSA\kSA BandiT

- **All reference files:** (If applicable) These have a **.bsrf** filename extension. By default, these are stored in the **Personal** subfolder, typically located in the following folder.

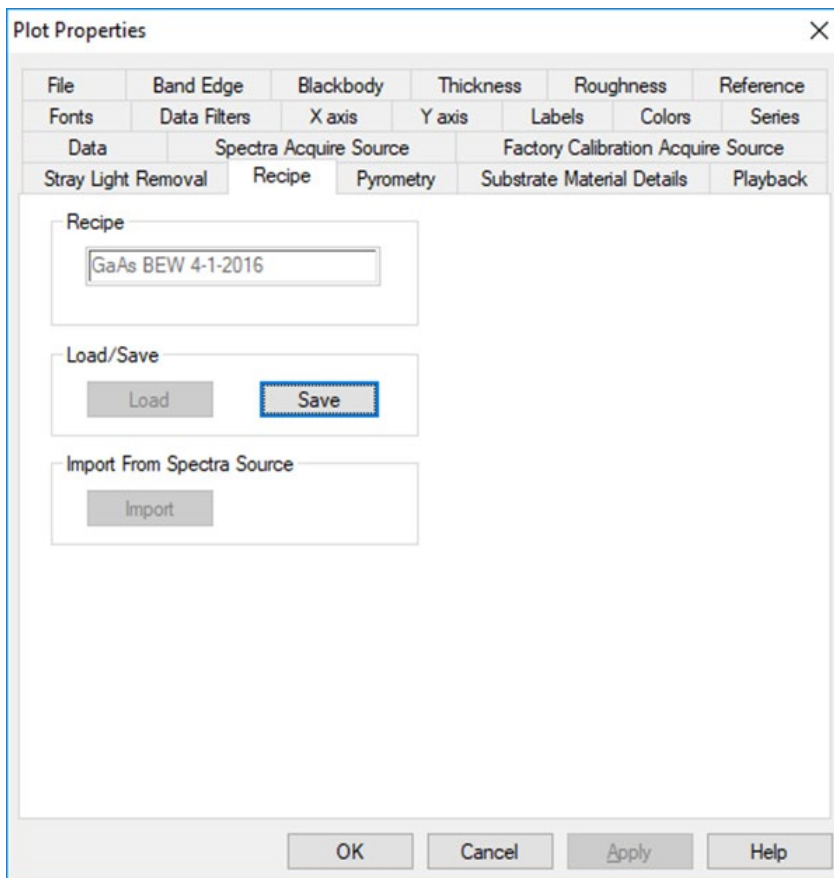
C:\Users\<User_Name>\Documents\kSA\kSA BandiT



3 Extracting Settings from Old Data Files

If you are unable to access the recipe used for data acquisition, you can extract it from an existing **kSA BandiT** data file (*.kdt) using the following procedure.

1. Open the applicable **kSA BandiT** data file.
2. Right-click anywhere in the plot pane and choose **Properties**.
3. Click the **Recipe** tab and click the **Save** button.
4. Enter a name for the recipe file, and click Save.



Notes

- You may also want to record settings for the various measurements on the corresponding tabs (e.g. **Band Edge**, **Thickness**, **Blackbody**, **Pyrometry**, etc.) and other settings, such as **Reference**, **Substrate Material Details**, **Stray Light Removal**, etc.
- You can extract data from files that contain reference spectra (*.bsrf) data only if the **Store raw and fully processed spectra** option was selected when the *.kdt file was created.



4 Preparing for Installation of the BandiT Application

 **IMPORTANT!** Be sure that the computer is **not** connected to the **kSA BandiT** hardware before you install the software.

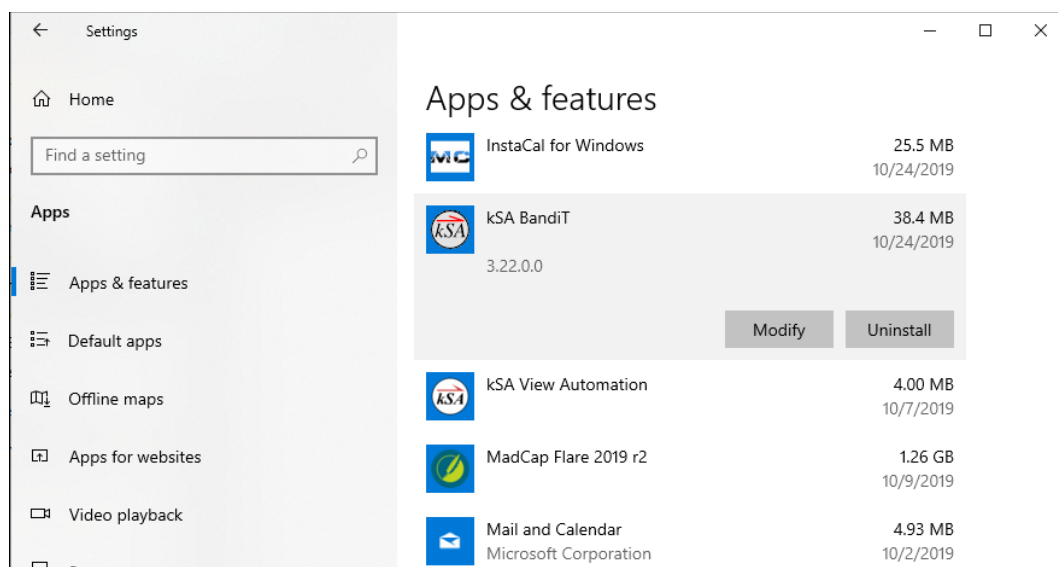
Before you install the **kSA BandiT** software application, there are some steps you should take to prepare the computer.

4.1 Copy the installation files

1. Locate the **kSA BandiT** installation folder on the installation media provided by k-Space (usually a USB drive), or download it from the k-Space ftp site at <ftp://customers.k-space.com/>. Your k-Space representative will provide the **User name** and **Password**.
2. Copy the **kSA BandiT** installation folder to the computer's desktop.

4.2 Uninstall prior versions of kSA BandiT

If the **kSA BandiT** application has previously been installed on this computer, use the **Windows Uninstall** tool to remove the existing version of **kSA BandiT**.



4.3 Install A/D board files

The procedure below describes the steps for installing AIO data acquisition board files. Please note, however, that other A/D boards exist, and the steps in install those files may differ slightly.

1. Navigate to the **kSA BandiT\AIO** folder on the computer's desktop.
2. Right-click the **USB-AIO16-16A Install.exe** file and choose **Run as administrator**.
3. If Windows displays a security prompt, click **Install**.



4. In the USB-AIO16-16A Installer dialog, click the **Install** button.
5. When the installation is complete, click **OK**.

4.4 Install CDISpec32 files

1. Navigate to the **kSA BandiT\cdispec32** folder on the computer's desktop.
2. Right-click the **CdiSpecInstall.exe** file and choose **Run as administrator**.
3. If Windows prompts you to allow it to make changes to your computer, click **Yes**.
4. In the CdiSpec InstallShield Wizard welcome screen, click **Next**.
5. In the License Agreement screen, read the software license agreement, choose the **I accept the terms in the license agreement** option, and click **Next**.
6. Read the information in the Readme Information screen for important version information, and then click **Next**.
7. (Optional) In the Customer Information screen, enter the user name and company name associated with the **kSA BandiT** system. Your k-Space engineer may already have entered this information for you.
8. In the Destination Folder screen, click **Next** to install the files in the default location, or click the **Change** button to specify a different location.
9. In the Select Drivers to Install screen, choose the **Install Only Modern Drivers (VID 135F)** option and click **Next**.



Note: If you are installing the **kSA BandiT** software on an older computer, you can choose the **Install Modern and Legacy Drivers (VID 0547 and VID 135F)** option.

10. In the Setup Type screen, choose the **Typical** option and click **Next**.
11. In the Ready to Install the Program screen, click **Install**.
12. When the Setup Devices dialog opens, click **OK**, and then click OK when prompted that the driver installed successfully.
13. Click **Finish**.

4.5 Install analysis-only version (optional)

If you are installing the analysis-only version (for off-line analysis of previously acquired data), follow these steps. **If you are installing the full version, proceed to the next section.**

1. If the USB sentinel key is connected to the computer, remove it.
2. Navigate to the **kSA BandiT** folder on the computer's desktop.
3. Right-click the **kSA_BandiT_setup.exe** file and choose **Run as Administrator**.
4. In the kSA BandiT welcome screen, click **Next**.
5. Verify that the **kSA BandiT** USB Sentinel key is **not** plugged in the computer, and click **Yes**.



6. In the Customer Information screen, enter the user name and company name associated with the **kSA BandiT** system, and then click **Next**.
7. In the Choose Destination Location screen, click **Next** to install the files in the default location, or click the **Browse** button to specify a different location.
8. In the Setup Type screen, choose the **Typical** option and click **Next**.
9. In the Start Copying Files screen, click **Next** to install the files.
10. Click **Finish** and restart the computer.
11. Insert the USB sentinel key.

The installation of the analysis-only version is complete and ready to use.



5 Installing the kSA BandiT Software

Follow these steps to install the **kSA BandiT** software.

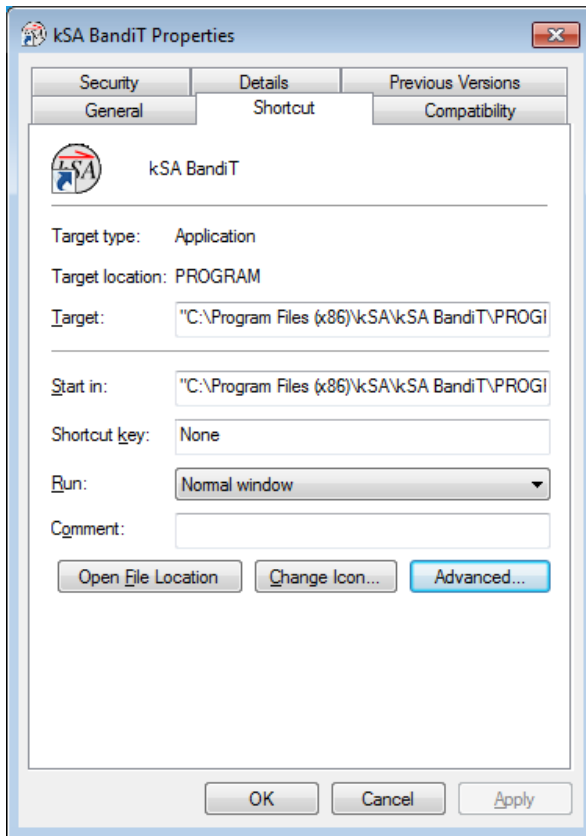
1. If the USB sentinel key is connected to the computer, remove it.
2. Navigate to the **kSA BandiT** folder on the computer's desktop.
3. Right-click the **BanditInstaller.msi** file and choose **Install**.
4. If Windows prompts you to allow it to make changes to your computer, click **Yes**.
5. In the kSA BandiT welcome screen, click **Next**.
6. In the Destination Location screen, click **Next** to install the files in the default location, or click the **Change** button to specify a different location.
7. In the Ready to Install screen, click **Install** to begin the installation.
8. When the installation is complete, click **Finish**.
9. Restart the computer, and then insert the USB sentinel key.

5.1 Modify the kSA BandiT application shortcut

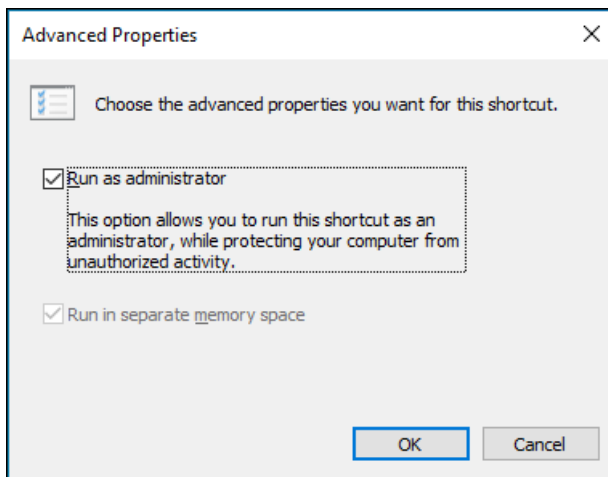
After the installation is complete, we recommend that you modify the shortcuts used to launch the **kSA BandiT** application to always run as an administrator. If you don't do this, you may encounter issues when you save changes to the kSA system files stored in the **C:\Program Files (x86)\kSA\kSA BandiT\PROGRAM** folder.

Follow these steps to modify the shortcut.

1. Right-click the **kSA BandiT** shortcut and choose **Properties**.
2. Click the **Advanced** button on the **Shortcut** tab.



3. In the Advanced Properties dialog, check the **Run as administrator** box and then click OK to close the Advanced Properties dialog.



4. In the **kSA BandiT** Properties dialog, click OK to save the changes to the shortcut.
5. Insert the USB sentinel key and connect the computer to the **kSA BandiT** electronics rack (but do **not** turn on the **kSA BandiT** system), then proceed to configuring the **kSA BandiT** application.



6 Configuring the kSA BandiT Application


After you successfully install the third-party drivers and the **kSA BandiT** software, you need to configure the application for your specific tool.

6.1 Copy saved files to the new computer

If you are installing the **kSA BandiT** software on a new computer, copy the following files and folders from the old computer to corresponding locations on the new computer. These are the files you saved in Chapter 2 of this guide.

- Recipe files
- Settings files
- Spectrometer folders
- Dark background files
- Reference spectra files

6.2 Set up the spectrometer

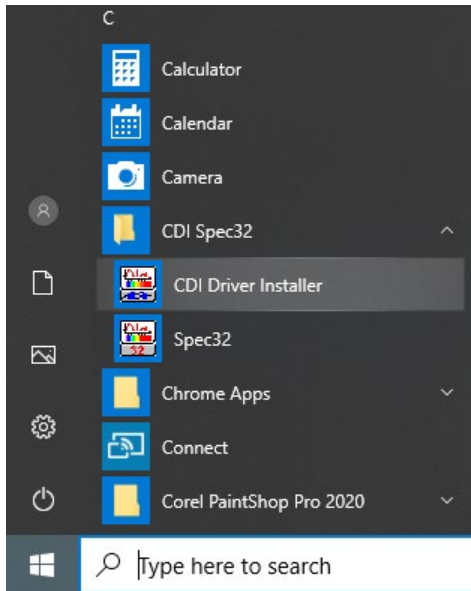
1. Open the Windows Device Manager, and leave it open.
 - a. Enter **Device manager** in the search field on the Windows taskbar and then press **ENTER** on your keyboard.

The screenshot shows the Windows taskbar search bar with the text 'device manager' entered. To the right of the search bar are several application icons: a circle, a task view icon, a blue icon, the Google Chrome icon, the Microsoft Edge icon, and a red icon.

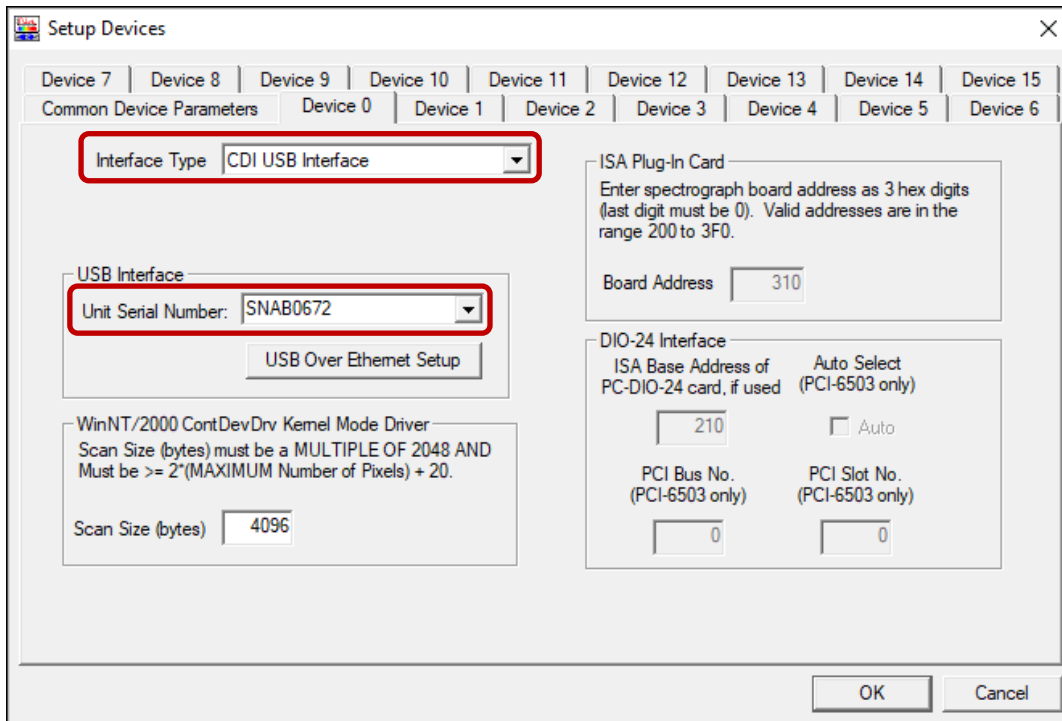
 - b. In the Device Manager window, expand the **Ports (COM & LPT)** and **Universal Serial Bus controllers** items.
2. Turn on the **Main Power** switch on the **kSA BandiT** system. As the system starts up, watch the Device Manager and take note of the new items that appear in the **Ports (COM & LPT)** and **Universal Serial Bus controllers** lists.
3. Create a subfolder for the spectrometer setup file and data.
 - a. Navigate to the **C:\Program File (86)\kSA\kSA BandiT\PROGRAM\Spectrometers** folder.
 - b. Right-click in the Windows Explorer window and choose **New / Folder**.
 - c. Enter the spectrometer serial number as the folder name (e.g., SNAB0672).



- Click the Windows start button and choose **CDI Spec32 / Driver Installer**.

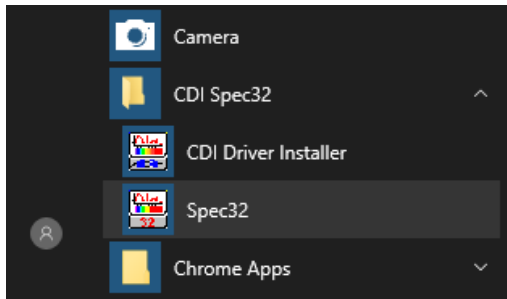


- In the Setup Devices dialog, click the **Device 0** tab.
- In the **Interface Type** field, select **CDI USB Interface**.
- In the **Unit Serial Number** field, enter or select the applicable spectrometer serial number.





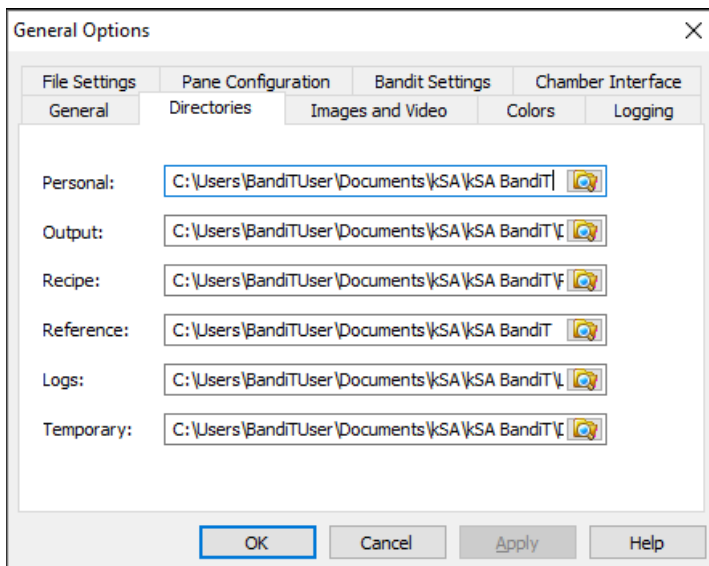
- Click the Windows Start button and choose **CDI Spect32 / Spec32**.



- At the warning prompt asking about spectrometer files, click **No** to use the files that are stored on the spectrometer.
- In the Spec32 application, choose **File / Save Setup**.
- Navigate to the subfolder you created in Step 3, above, enter the spectrometer serial number in the **File name** field, and click **Save**. The application saves the spectrometer setup information in a **.stp** file in that folder.
- Close the Spec32 application.

6.3 Configure general options

- Launch the **kSA BandiT** software application.
- Choose **Options / Load Settings** and click **Yes** when prompted to load archived preferences.
- Navigate to the location where the settings file (**.ksaxml**) is stored.
- Choose **Options / General** and click the **Directories** tab.
- Confirm the default folder locations for each file type.

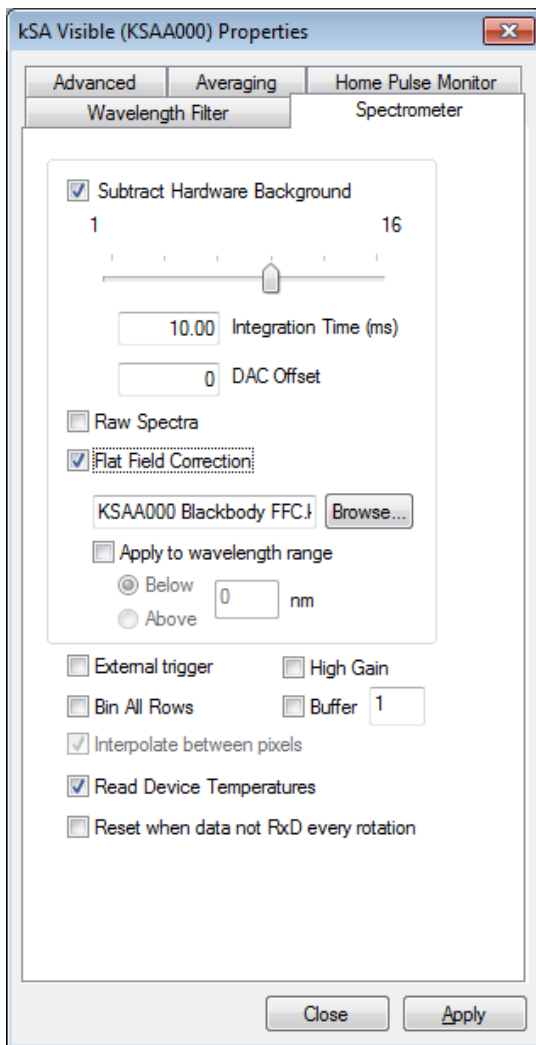




6.4 Enable the spectrometer's flat field correction and external trigger

If applicable, enable the spectrometer's **Flat Field Correction** (FFC) as follows.

1. Click the **View** menu and choose the applicable live spectrometer from the menu.
2. Right-click the spectrometer window and choose **Properties**.
3. In the Properties dialog, click the **Spectrometer** tab.
4. Check the **Flat Field Correction** checkbox, then click the **Browse** button.
5. Navigate to the spectrometer's setup folder (**C:\Program Files (x86)\kSA\kSA BandiT\PROGRAM\Spectrometers\<SNxx nnnn>**) and select the **<SNxx nnnn> Blackbody FFC.kdt** file, where **<SNxx nnnn>** represents the spectrometer serial number.



6. Check the **External trigger** checkbox.
7. Click the **Apply** button and then close the dialog.



6.5 Configure optional ports

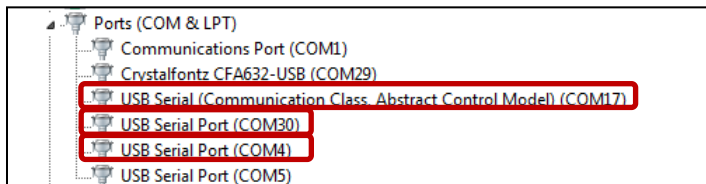
The port settings described here should have been configured automatically during installation. However, in some cases, you may need to manually set the **COM** port, as described below.



Notes

- All **kSA BandiT** systems include the **Rotation Monitor** hardware. However, your system setup may not use this feature.
 - Most, but not all, **kSA BandiT** systems include a **BandiT Light Source**. Your system may or may not include this feature.
 - The **Detector Motion Hardware** is an optional add-on feature. Your system may or may not include this hardware.
-

1. In the Windows Device Manager, expand the **Ports (COM & LPT)** item and locate the following items.
 - USB Serial (Communication Class, Abstract Control Model)
 - USB port associated with the Light Source
 - USB port associated with the Detector Motion

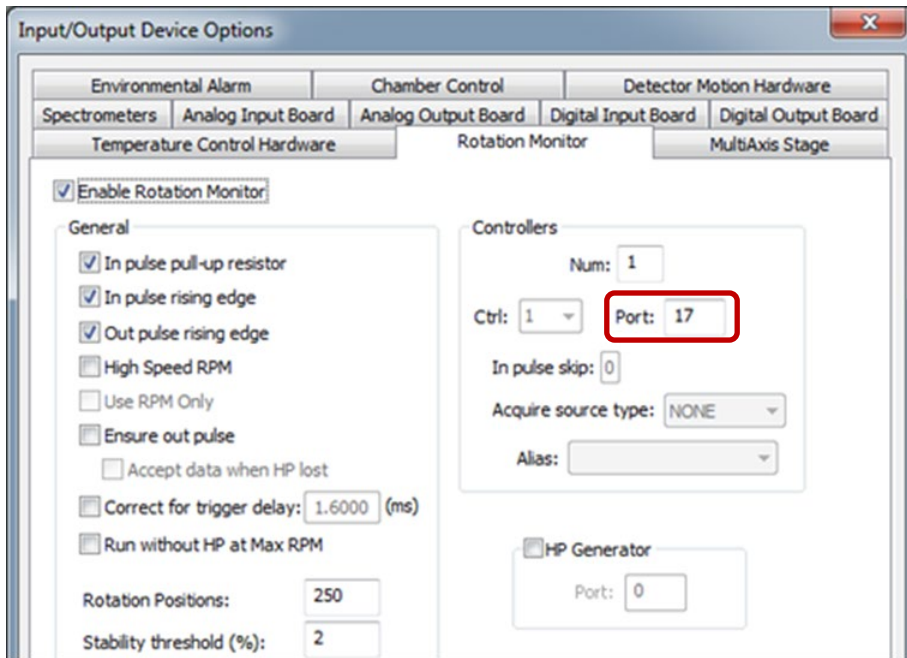


2. Note the communications port number associated with each item. (In the image above, they would be **COM17**, **COM30**, and **COM4**, respectively.)

6.5.1 Rotation Monitor (Optional)

If your **kSA BandiT** system is configured to use the Rotation Monitor feature, complete the steps below. If you do not use this feature, you can skip to the next section.


1. In the **kSA BandiT** software, choose **Options / Input/Output Devices** and click the **Rotation Monitor** tab.
2. In the **Port** field, enter the port number that you noted in the Windows Device Manager.

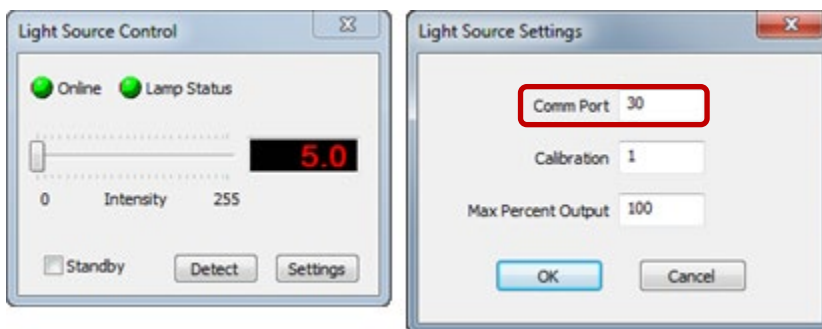


3. Check the **Enable Rotation Monitor** checkbox, and click **OK**.
4. When prompted to reinitialize all boards, click **Yes**.

6.5.2 Light Source (Optional)

If your **kSA BandiT** system includes a BandiT Light Source, follow the steps below. If your system does not have this light source, you can skip to the next section.

1. Choose **View / Light Source Control** or click the Light Source  button on the toolbar.
2. In the Light Source Control dialog, click the **Settings** button.
3. In the **Comm Port** field, enter the port number that you noted from the Windows Device Manager.

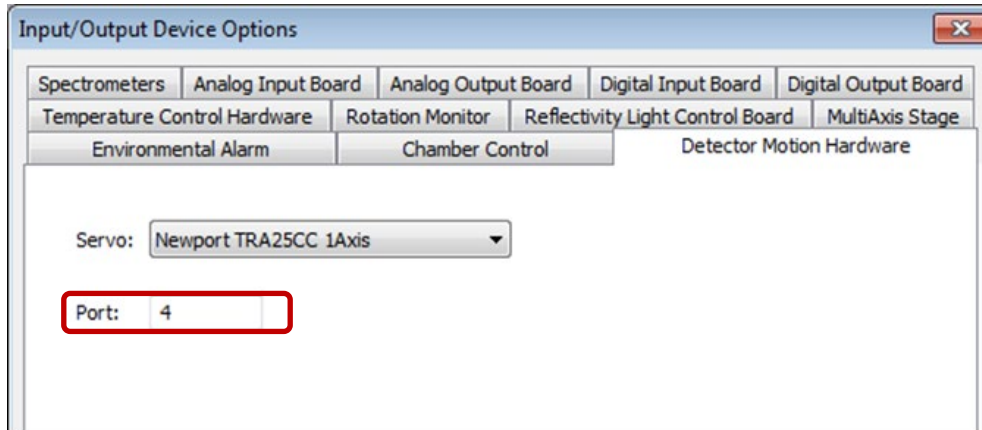




6.5.3 Detector Motion (Optional)

If your **kSA BandiT** system includes the optional add-on Detector Motion Hardware, follow the steps below. If your system does not include this hardware, you can skip to the next section.

1. In the **kSA BandiT** application, choose **Options / Input/Output Devices** and click the **Detector Motion Hardware** tab.
2. In the **Port** field, enter the port number that you noted from the Windows Device Manager.

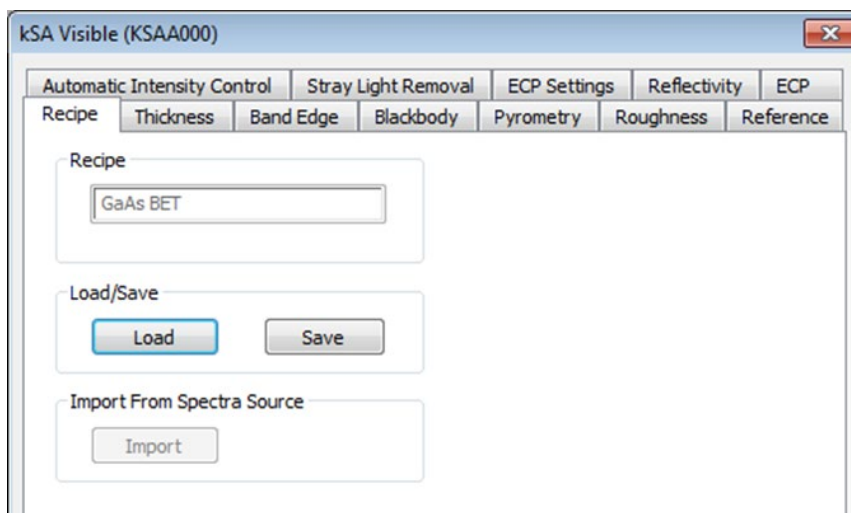


6.6 Load recipe files

For all k-Space software applications, the recipe files contain specific settings (band edge temperature, blackbody temperature, etc.) that apply to the k-Space tools.

1. Choose **Acquire / BandiT Temperature** and click **Config** button in the Spectra Source section.
2. In the spectrometer source dialog, click the **Recipe** tab, click the **Load** button, and navigate to the applicable recipe folder.

By default, the application looks in the **C:\Users\<User_Name>\Documents\kSA\kSA BandiT\Recipes** folder.





6.7 Configure additional spectrometers

If your **kSA BandiT** system contains multiple spectrometers, complete the following additional steps. **If your system has only one spectrometer, the installation is complete, and you may skip the remaining steps.**

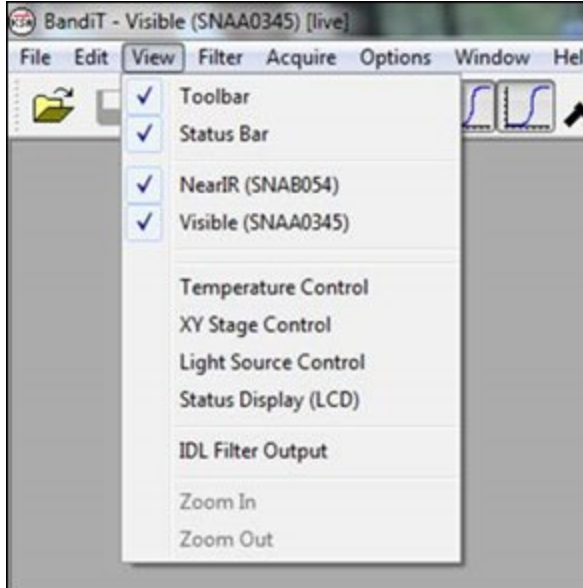
1. Ensure that the **kSA BandiT** application is not running, then click the Windows Start button and choose **CDI Spec32 / CDI Driver Installer**.
2. Click the **Device 0** tab, and ensure that **CDI USB Interface** is selected in the **Interface Type** field and that the serial number of the first spectrometer is displayed in the **Unit Serial Number** field.
3. Click the **Device 1** tab, ensure that **CDI USB Interface** is selected and that the serial number of the second spectrometer is displayed.
4. Click **OK**. You should receive a message stating **Driver successfully installed**. If you do not, you may need to repeat this process.
5. Restart the **kSA BandiT** application.
6. Choose **Options / Input/Output Device Options**.
7. Click the **Spectrometers** tab, check the **Enable** box for each applicable device, and click **OK**.

Device	Serial Number	Reference Tolerance (nm)	Enable
Device0	(SNAB0259)	0.200	<input checked="" type="checkbox"/> Enable
Device1	(SNAA0320)	0.200	<input checked="" type="checkbox"/> Enable
Device2			<input type="checkbox"/> Enable
Device3			<input type="checkbox"/> Enable



8. When prompted to re-initialize all boards, click **Yes**.


After the initialization process is complete, all spectrometers should be listed on the **View** menu, and the **kSA BandiT** application should be able to communicate with the spectrometers.

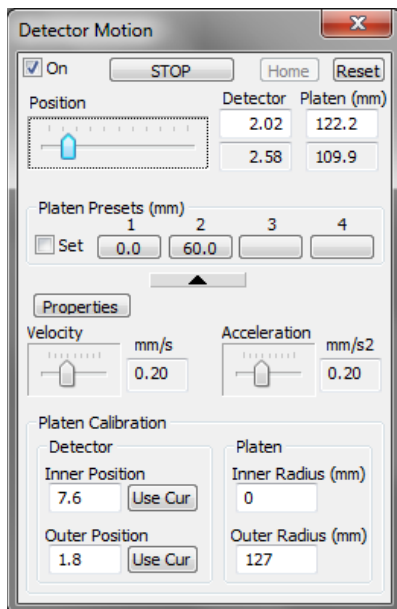


7 kSA BandiT Scanning Detector Setup and Calibration (Optional)

The Scanning Detector is an optional piece of hardware that you can add to your **kSA BandiT** system. If your system includes this hardware, you will need to home the detector (send it to the zero position) the first time you use the **kSA BandiT** system. If your system does not include the Scanning Detector hardware, you can skip this section.

Note that this process requires that the detector swing through a large angular range. So before you start the process, be sure there are no potential obstructions. You may also need to do this if communications between the **kSA BandiT** electronics and detector have been interrupted.

- Choose **View / Detector Motion** or click the Detector Motion  button on the toolbar to see the detector motion calibration settings.



The detector motion should be calibrated to give the true radial position (in mm). For the case illustrated above, the red alignment laser was used to determine that a detector position setting of 7.6 corresponded to the center of the 10" (254 mm) platen.

- That same value was chosen for the **Inner Position**, corresponding to an **Inner Radius** of 0.
- An **Outer Position** setting of 1.8 corresponded to the outer edge of the platen, which corresponds to an **Outer Radius** value of 127 mm.

After the system is calibrated, you can specify the position by entering the desired value in either detector units or platen units (which should correspond to the true radial position in mm). You can also set up to four preset buttons for frequently used detector positions.

Note that you should not need to change the velocity and acceleration values from their preset values.



During platen mapping, the detector moves to the desired radial position, then waits for the next home pulse. It then starts collecting data as a function of the azimuthal angle. You can specify the number of azimuthal measurements per rotation, up to a maximum of 250. This represents a trade-off between angular resolution and integration time/rotation speed. The detector then moves to the next radial position in the sequence and repeats the process. The size of the radial steps represents a trade-off between radial resolution and overall acquisition time.

The dialog box is titled "Full Platen Temperature Acquisition". It contains the following sections and controls:

- Measurement configuration**
 - Spectra Source:** A dropdown menu showing "kSA Visible (KSAA000)" with a "Config..." button to its right.
 - Substrate material:** A dropdown menu showing "GaAs" with "Select..." and ">>" buttons to its right.
 - Run Name:** A text input field containing "test ...".
- Platen Scan Parameters**
 - Three input fields for "Inner Radius (mm)" (0), "Outer Radius (mm)" (126), and "Step (mm)" (2).
 - Two radio buttons: "Full Platen Scan" (selected) and "Line scan at position" (0).
 - A checkbox for "Custom" is disabled.
 - A "Retry:" label followed by an input field containing "3".
 - A checked checkbox labeled "Always start scan at inner platen radius".
- Buttons:** A large green "Start" button and a large red "Close" button.
- Iterations:** An input field containing "1" and an "Advanced..." button.
- Other:** A checkbox labeled "Turn off Light Source at end of run" is unchecked.



8 Other Setup Tasks


8.1 Reset the Teensy board

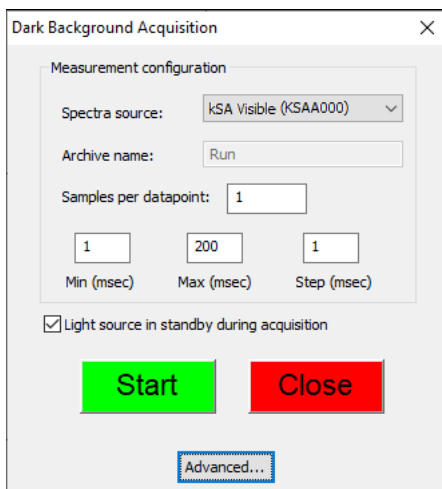
The **kSA BandiT** system includes a “Teensy” microprocessor board that needs to be reset after the software has been installed and configured.

1. Navigate to the **kSA BandiT \ Teensy** folder on the computer’s desktop.
2. Right-click the **teensy.exe** file and choose **Run as administrator**.
3. In the Teensy application, choose **File / Open Hex File**.
4. Select the **kSATeensySerial 1286.hex** file and click **Open**.
5. Click the **Auto** button on the toolbar to enable Automatic mode.
6. Press the **Reset** button on the Teensy board.

8.2 Take a Dark Background measurement

It is a good idea to take a new Dark Background measurement to remove noise from the live spectra.

1. Choose **Acquire / Dark Background** or click the Dark Background  icon on the toolbar.



2. Enter the following values.
 - **Min:** 1
 - **Max:** 200
 - **Step:** 1
3. Click **Start**.
4. After the Dark Background acquisition is complete, close the dialog.

Your **kSA BandiT** system and software should now be ready to go!



9 Contacting k-Space

k-Space Associates, Inc. stands behind all tools and software it provides to its customers. If you find that you need support or service on any k-Space products, please contact us.

Telephone: (734) 426-7977

Fax: (734) 426-7955

Email: requestinfo@k-space.com