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 <u>www.k-space.com</u> <u>requestinfo@k-space.com</u>



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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: <u>requestinfo@k-space.com</u> Web: <u>www.k-space.com</u>



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6	Conf 6.1 6.2 6.3 6.4 6.5 6.5.1 6.5.2 6.5.3 6.6 6.7	iguring the kSA BandiT Application 1 Copy saved files to the new computer. 1 Set up the spectrometer. 1 Configure general options 1 Enable the spectrometer's flat field correction and external trigger 1 Configure optional ports 1 Rotation Monitor (Optional) 1 Light Source (Optional) 1 Load recipe files 1 Configure additional spectrometers 2	3 3 3 5 6 7 7 8 9 9 0
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6 7 8	Conf 6.1 6.2 6.3 6.4 6.5 6.5.1 6.5.2 6.5.3 6.6 6.7 kSA	iguring the kSA BandiT Application 1 Copy saved files to the new computer. 1 Set up the spectrometer 1 Configure general options 1 Enable the spectrometer's flat field correction and external trigger 1 Configure optional ports 1 Rotation Monitor (Optional) 1 Light Source (Optional) 1 Load recipe files 1 Configure additional spectrometers 2 BandiT Scanning Detector Setup and Calibration (Optional) 2 r Setup Tasks 2	3 3 3 5 6 7 7 8 9 9 0 2 4
6 7 8	Conf 6.1 6.2 6.3 6.4 6.5.1 6.5.2 6.5.3 6.6 6.7 kSA 0the 8.1	iguring the kSA BandiT Application 1 Copy saved files to the new computer 1 Set up the spectrometer 1 Configure general options 1 Enable the spectrometer's flat field correction and external trigger 1 Configure optional ports 1 Rotation Monitor (Optional) 1 Light Source (Optional) 1 Load recipe files 1 Configure additional spectrometers 2 BandiT Scanning Detector Setup and Calibration (Optional) 2 Reset the Teensy board 2	3 3 3 5 6 7 7 8 9 9 0 2 4 4
6 7 8	Conf 6.1 6.2 6.3 6.4 6.5 6.5.1 6.5.2 6.5.3 6.6 6.7 kSA 0the 8.1 8.2	iguring the kSA BandiT Application 1 Copy saved files to the new computer. 1 Set up the spectrometer. 1 Configure general options 1 Enable the spectrometer's flat field correction and external trigger 1 Configure optional ports 1 Rotation Monitor (Optional) 1 Light Source (Optional) 1 Detector Motion (Optional) 1 Load recipe files 1 Configure additional spectrometers 2 BandiT Scanning Detector Setup and Calibration (Optional) 2 r Setup Tasks 2 Reset the Teensy board 2 Take a Dark Background measurement 2	3 3 3 5 6 7 7 8 9 9 0 2 4 4



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.

Automati	c Intensity Co	ontrol	Stray I	Light Removal	ECP Settin	gs Reflectiv	vity ECP
Recipe	Thickness	Band	Edge	Blackbody	Pyrometry	Roughness	Reference
Recip	e						
	a As BET			-			
G	AAS DET						
load	Save						
Load/	Save	_					
-Load/	Save Load		Save				
Load/	Save Load		Save				
Load/	Save Load t From Spectr	a Source	Save				
Load/	Save Load t From Spectr	a Source	Save				

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.



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

Measurement configuration	Substrate material details	
kSA Visible (KSAA000) Config	Revision:	1
	Thickness (um):	340.0
Substrate material: GAAS V Select	Polish:	SSP
Archive name: test	Cal. Film Thickness (um):	0.00
Duration:	Conductivity:	SI
Continuous (no data saved)	Dopant:	
	Carrier conc. (cm^-3):	
	Resistivity:	16000000
Turn off Light Source at end of run	Absorption mode:	Reflection
Measurement Mode	Manufacturer:	DOWA
 BandEdge Pyrometry/Blackbody 	Comments:	Corrected. Linear Fit. 2"
BandEdge/Pyrometry/Blackbody		
Control Light Source based on mode		
Advanced		

2.2 General options

Save the general settings for the application.

- 1. 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.

🐵 BandiT - kSA Visible (KSAA000) [paused]						
File Edit View Filter Acquire	Options Window Help					
Current Output	General Input/Output Devices Substrate Materials Setup Logging Save Settings Load 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.

Environmen	ntal Alarm	Cha	mber Control	Detector I	Motion Hardware
Spectrometers	Analog Input Boar	d Analo	g Output Board	Digital Input Board	Digital Output Board
Temperatu	re Control Hardwar	re	Rotation N	Ionitor	MultiAxis Stage
Ceneral Ceneral Cin pulse p C	tion Monitor bull-up resistor ising edge er rising edge ed RPM Only ut pulse t data when HP los for trigger delay: 1 but HP at Max RPM sitions: 2 eshold (%): 2 Gear Ratio Inner:	t 6000 (m 	Controlle Ctrl: 1 In pub Acquir Alia	Port: 17 Port: 17 se skip: 0 re source type: NOP as: Port: 0	IE V



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.

Spectromete	rs	Analog Input Bo	bard	Analog Outpu	t Board	Di	gital Input Board	Dig	ital Output Board	
Temperature Control Hardware			Ro	tation Monitor	Reflect	ivity	Light Control Boa	rd	MultiAxis Stage	
Enviro	nme	ntal Alarm		Chamber Control			Detector M	lotio	n Hardware	
Servo:	Nev	vport TRA25CC	1Axis	•	J					

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.

Detector Motion	×
On STOP	Home Reset
Position	Detector Platen (mm)
	2.02 122.2
	2.58 109.9
Platen Presets (mm)	
	3 4
Properties	
Velocity	Acceleration
mm/s	mm/s2
0.20	0.20
Platen Calibration	
Detector	Platen
7.6 Use Cur	Inner Radius (mm)
Outra Davitian	Output to (m.)
1.8 Use Cur	127



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.

File	Band Ed	ge	Blackb	ody	Thick	kness	Rou	ghness	Reference	
Fonts	Data Filt	ers	X axis	S	Y axis	L	abels	Colors	Series	
Data	S	pectra	Acquire \$	Source		Facto	ory Calib	ration Acqui	ire Source	
Stray Light	t Removal	Ree	cipe	Pyrome	etry	Substra	te Mater	ial Details	Playback	
Recipe										
	DEW A1	2010								
Gar	S BEVV 4-1-	2016								
Load/S	ave									
		-								
			C							
	Load		Save							
Innered	Load	L	Save							
Import I	Load	a Sourc	Save ce							
Import I	Load From Spectra Import	a Source	Save ce							
Import I	Load From Spectra	Source	Save							
Import I	Load From Spectra	a Sourc	Save							
- Import I	From Spectra	a Sourc	Save ce							
Import I	Load From Spectra	a Sourc	Save ce							
Import I	Load From Spectra	a Sourc	Save							
- Import I	Load From Spectra	a Sourc	Save							
Import I	Load	a Sourc	Save							
Import I	Load From Spectra	a Sourc	Save							
Import I	Load From Spectra	a Sourc	Save							
Import I	From Spectra	a Sourc	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

U 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

- 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 <u>ftp://customers.k-space.com/</u>. 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**.

← Settings		-	
ம் Home	Apps & features		
Find a setting	InstaCal for Windows	25.5 MB 10/24/2019	
Apps	kSA BandiT	38.4 MB 10/24/2019	
Ē Apps & features	3.22.0.0		
: I⊒+ Default apps		Modify Uninstall	
邱 <u></u> Offline maps	kSA View Automation	4.00 MB 10/7/2019	
Apps for websites	MadCap Flare 2019 r2	1.26 GB 10/9/2019	
D Video playback	Mail and Calendar	4.93 MB	
C Startup	interessit corporation	10/2/2015	

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 adminstrator.
- 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 cumputer'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.



🐒 kSA BandiT Pr	operties	×					
Security	Details	Previous Versions					
General	Shortcut	Compatibility					
ks ks	kSA BandiT						
Target type:	Application						
Target location:	PROGRAM						
<u>T</u> arget:	"C:\Program Files (x86)\k	SA\kSA BandiT\PROGI					
<u>S</u> tart in:	"C:\Program Files (x86)\k	SA\kSA BandiT\PROGI					
Shortcut <u>k</u> ey:	None						
<u>R</u> un:	Normal window	•					
Comment:							
Open <u>F</u> ile Lo	cation Change Icon	Advanced					
	ОК	Cancel Apply					

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.

	ho device manager	0	äi	•	9	e	۶
	O device manager	0	H				

- b. In the Device Manager window, expand the **Ports (COM & LPT)** and **Universal Serial Bus controllers** items.
- Turn on the Main Power swtich 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).



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



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

🗱 Setup Devices	×
Device 7 Device 8 Device 9 Device 10 Device 11 Common Device Parameters Device 0 Device 1 Device	Device 12 Device 13 Device 14 Device 15 2 Device 3 Device 4 Device 5 Device 6
Interface Type CDI USB Interface	ISA Plug-In Card Enter spectrograph board address as 3 hex digits (last digit must be 0). Valid addresses are in the range 200 to 3F0.
USB Interface Unit Serial Number: SNAB0672	Board Address 310
USB Over Ethernet Setup	DIO-24 Interface ISA Base Address of Auto Select PC-DIO-24 card, if used (PCI-6503 only)
WinNT/2000 ContDevDrv Kemel Mode Driver Scan Size (bytes) must be a MULTIPLE OF 2048 AND Must be >= 2*(MAXIMUM Number of Pixels) + 20.	210 Auto PCI Bus No. PCI Slot No. (PCI-6503 only) (PCI-6503 only)
Scan Size (bytes) 4096	0 0
	OK Cancel



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



- 9. At the warning prompt asking about spectrometer files, click **No** to use the files that are stored on the spectrometer.
- 10. 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.
- 12. Close the Spec32 application.

6.3 Configure general options

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

General Options					×
File Settings General	Pane Configu Directories	ation Image	Bandit Setting as and Video	gs Chamb Colors	ber Interface Logging
Personal:	C:\Users\Bandi	TUser \D	ocuments\kSA\k	SA BandiT	2
Output:	C:\Users\Bandi	TUser \D	ocuments\kSA\k	SA BandiT 🕻 🕻	3
Recipe:	C:\Users\Bandi	TUser \D	ocuments\kSA\k	SA BandiT 🖟 🕻	2
Reference:	C:\Users\Bandi	TUser \D	ocuments\kSA\k	SA BandiT 👔	2
Logs:	C:\Users\Bandi	TUser \D	ocuments\kSA\k	SA BandiT 🖟 🕻	3
Temporary:	C:\Users\Bandi	TUser \D	ocuments\kSA\k	SA BandiT 🕻 🕻	2
	OK		Cancel	<u>A</u> pply	Help



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.

kSA Visible (KSAA000) Properties	x
Advanced Averaging Home Pulse Monitor Wavelength Filter Spectrometer	
 Subtract Hardware Background 1 16 10.00 Integration Time (ms) 0 DAC Offset Raw Spectra Flat Field Correction KSAA000 Blackbody FFC.J Browse Apply to wavelength range Below nm Above nm External trigger High Gain Bin All Rows Buffer Interpolate between pixels Read Device Temperatures Reset when data not RxD every rotation 	
Close Apply	

- 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.



Environmental Alarm		Chamber	Control	Det	tector M	lotion Hardware	
Spectrometers Analog Input	Board	Analog Ou	Itput Board	Digital Input	Board	Digital Output Board	
Temperature Control Hardware		Rotation M	onitor		MultiAxis Stage		
Enable Rotation Monitor							
General			Controlle	rs			
In pulse pull-up resistor				Num: 1			
In pulse rising edge			Chile 1	- Dert	17		
Out pulse rising edge			C01: 1	Port	: 1/		
High Speed RPM			In puls	e skip: 0			
Use RPM Only			Acquir	e source type	: NON	E 👻	
Ensure out pulse		Alias:					
Accept data when Hi	Plost		Alias:				
Correct for trigger delay	y: 1.60	00 (ms)					
Run without HP at Max	RPM			HP Generator			
Rotation Positions:	250			Port: 0			
Stability threshold (%):	2						

- 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
- 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.

ght Source Control	Light Source Settings
Online Lamp Status	Comm Port 30
<u>.</u>	Calbration 1
0 Intensity 255	Max Percent Output 100
Standby Detect Settings	OK Cancel



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** applicaton, 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.

Spectrometer	s Analog Input B	oard Analog Outpu	t Board	Digital Input Board	Digital Output Board	
Temperature	Control Hardware	Rotation Monitor	Reflectivi	ity Light Control Board MultiAxis Sta		
Environ	mental Alarm	Chamber Co	ontrol	Detector Motion Hardware		
Servo:	Newport TRA25CC	1Axis 🔻]			
Servo:	Newport TRA25CC	1Axis 🔻]			

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.

Automat	ic Intensity Co	ntrol Stra	y Light Removal	ECP Setting	s Reflectivi	ty ECP
Recipe	Thickness	Band Edge	Blackbody	Pyrometry	Roughness	Reference
Recip	e					
G	aAs BET					
	_					
Load	Save					
	Load	Save				
-						
Toolog av	rt From Spectr	a Source				
Impor						



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**.

Temperature Control Hardware			Rotat	ion M	lonitor	MultiAxis Stage	
Environme	ental Alarm	Cha	amber Contro	trol Detector Motion Hardware			lotion Hardware
Spectrometers	Analog Input Board	Analo	og Output Bo	ard	Digital Input Bo	ard	Digital Output Board
Device0 Device1	(SNAB0255	ə) D)	0.200		Enable		
Device2				E	Enable		
Device3				F	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.

Full Platen Temperature Acquisition
Measurement configuration Spectra Source
kSA Visible (KSAA000) Config
Substrate material: GaAs Select >>
test
Platen Scan Parameters 0 126 2
Inner Radius (mm) Outer Radius (mm) Step (mm)
Full Platen Scan
Custom Retry: 3
C Line scan at position
Always start scan at inner platen radius
Start Close
1 Advanced



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.

Dark Background Acquisition	×
Measurement configuration	
Spectra source: kSA Visible (KSAA	.000) ~
Archive name: Run	
Samples per datapoint: 1	
1 200 1 Min (msec) Max (msec) Step	p (msec)
Light source in standby during acquisitio	n
Start Clo	se
Advanced	

- 2. Enter the following values.
 - Min: 1
 - Max: 200
 - **Step:** 1
- 3. Click Start.
- 4. After the Dark Background acquistion 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