

TECHNICAL NOTE

Using FinePointe with Biaera AeroMP Exposure Controller

OVERVIEW

This technical note details the FinePointe configuration process required to run a study with Biaera AeroMP aerosol dose delivery control.

The Biaera AeroMP system is currently used to deliver aerosol exposures to research subjects based on approximations of the time required to dose an animal of a given size. This approach can result in an exposure that is too long or short depending on a given animal's physiology and various planes of anesthesia. By integrating DSI's FinePointe system with Biaera, dosing will be based on a specific animal's accumulated tidal volume, thus optimizing the aerosol exposure, improving animal dose accuracy.

The following sections describe the necessary steps to complete each stage of the process, which includes:

- Configuring a Legacy Dosimetry Hardware site
- Creating a Dosimetry Study with FinePointe
- Acquiring Data with FinePointe

The integrated FinePointe-AeroMP solution is compatible with FinePointe Dosimetry Hardware site. Communication between FinePointe and AeroMP occurs over a TCP/IP server. Once connected, FinePointe sends AeroMP tidal volume information. AeroMP will then send event information to FinePointe which gets saved with the acquired data as System Event marks, annotating the dataset.

Note: The AeroMP apparatus only needs to be configured once, each time the apparatus is physically changed.

CONFIGURE A LEGACY DOSIMETRY HARDWARE SITE

A Legacy Dosimetry Hardware site refers to either a Max II or QT1001 hardware apparatus. In this demonstration, a Max II will be used.

To configure a Legacy Dosimetry Hardware site:

1. Launch FinePointe Control Panel.

Note: You must be an administrator of the FinePointe Server's workstation.



2. Click Hardware Configuration from the main Control Panel dialog.

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Jsers y, or dele r roles	te Manage Studies and Laboratories View, modify, or upgrade laboratories and studies	Manage Member Servers Upgrade servers and add controllers
rver	Modify Security Policies	Hardware Configuration Create, modify, and delete configurations
	Status	
ion:	My DSI Laptop	Database: Ready and online.
erven	.\NINJA3	
	Log	

Figure 1. From the main window in the FinePointe Control Panel, click the Hardware Configuration button to create or edit the Dosimetry hardware configuration.

3. Create a new hardware configuration by clicking the **New Configuration** button to launch the **Configuration Wizard**.

Note: An existing configuration may be modified by double-clicking the configuration desired to add Biaera AeroMP aerosol control.

6	Controller Home Page/Hardware Configuration Bu							
General Actions	lardware Configuration							
Configuration Name	Instruments Included	Instrument Type						
Cheisi PFT	1	Max II						
Dose 003	1	Max II						
Lab RC	1	FinePointe Series RC Site						
NAM SF Demo Mouse	1	FinePointe NAM 2						
NAM SF Demo	1	FinePointe NAM 2						

Figure 2. From the Hardware Configuration page, you can create or modify the hardware configurations.



4. Page 1: Select Hardware

The objective of this page is to select the hardware apparatus to be used in this configuration.

a. Enter a **Name** for your Configuration.

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ion			Create New C	onfiguration			
emo	 1. Select Hardware 2. Define Sites 						
	3. Configure Sites	Name: New Configuration aboratory: My Laboratory					
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		🛃 Ch	neck Hardware Type	Serial Number	Refresh		
<u>ا</u> ۱			Max II	DEMO-001			
			Max II	DEMO-002			
0			FinePointe Series R	C Site DEMO-011			
			FinePointe Series R	C Site DEMO-012			

Figure 3. The first page of the Hardware Configuration wizard. Here you need to edit or change the configuration name and select the hardware you will use. Here the Max II demo hardware is selected.

- b. Select the Max II preamplifier as the Hardware Type.
- c. Click Next.
- 5. Page 2: Define Sites

The objective of this page is to add or remove Hardware sites for each subject apparatus to be used with this hardware configuration. A minimum of one site is required to continue through the Wizard.

1	(A New Configuration)	0 📀 🛞								
ation T	Create New Configuration									
	 1. Select Hardware 	The list below indicates the sites that will be included in this configuration. Sites associated with legacy devices (ie. MaxII) must be added manually.								
Demo Demo	2. Define Sites									
figui	3. Configure Sites	Site Na	ame	Chamber Type	Species	Delete				
		Rabbit	Site 1	Legacy Dosimetry Sil	Rabbit					
on		Rabbit	Site 2	Legacy Dosimetry Sit	Rabbit					
00										

Figure 4. Second page of the Hardware Configuration Wizard allows you to add and remove collection sites for this configuration. For each site, one subject can be acquired during a data collection session. For the AeroMP support, you need to select the Dosimetry Site.

- a. Add a site by selecting the Legacy Dosimetry Site from the Chamber Type dropdown.
- b. Select the **Species** being used in this Study.
- c. Click the 👽 button to add the site. Repeat for the number of sites desired.
- d. Click Next.
- 6. Page 3: Configure Sites (Biaera AeroMP Configuration)

The objective of this page is to connect the apparatus (e.g. Max II) to the Hardware sites and to specify any additional information for both the apparatus and the sites.

ieral Actions Hardware Configur	ation							
figuration isi PFT		Create	New Confi	guration				
RC 1. Select Hardware M SF Dema 2. Define Sites	You may mo Series sites) r compatible h	You may modify the settings for a site on this page. Manually created sites (not FinePointe Series sites) must be mapped to the appropriate legacy hardware. Choose a site to view its compatible hardware.						
M 3. Configure Sites	Rabbit Site 1							
	Site Label: Species:	Site Label: Rabbit Site 1 Ty Species: Rabbit -				Type: Legacy Dosimetry Site Host Biaera AeroMP Server TCP Listening Port: 6722		
		Flow			Concentration			
P 000 P Apriea P Demo St								
	Lead 1	Lead 2	Lead 3	Lead 4	Lead 5	Lead 6	Lead 7	Lead 8
	Lead 9	Lead 10	Lead 11	Lead 12	Lead 13	Lead 14	Lead 15	Lead 16
	Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8
		Preamp Configuration						
	Max II [SNDE	MO-001]						
		_	_	Cance	Ba	ick	Next]	Finish

Figure 5. The final page of the Hardware Configuration wizard. On this page, you specify most of the settings for each site in the hardware configuration.

This page is divided in two sections:

Hardware sites (top) – presents the hardware sites and definitions for the sites defined in Page 2. A tab is available for each site configured. In this example, the tabs are labels "Rabbit Site 1" and "Rabbit Site 2" Apparatus (bottom) – presents the Max II input leads and outputs.



To configure Page 3, you need to know to which Max II leads the transducers are physically connected.

- a. Connect the Hardware site's **Flow** input to the appropriate **Max II Lead** by dragging and dropping the graphical **Flow** connection onto the **Max II Lead**.
- b. (Optional) Connect the Hardware site's Concentration input to the appropriate Max II Lead.
- c. Repeat for the remaining Hardware sites configured.
- d. Configure Biaera AeroMP integration:
 - i. Click the Host Biaera AeroMP Server checkbox to enable the feature.
 - ii. Specify the **TCP Listening Port** on which FinePointe will listen for AeroMP messages.

Note: If multiple Biaera AeroMP devices are being used, one per hardware site, a disparate **TCP Listening Port** must be specified for each. For example, The **TCP Listening Port** for Rabbit Site 1 is 6723 (Figure 6), which for Rabbit Site 2 it is 6733 (Figure 7).

General Actions Hardware Configuration Configuration Create New Configuration Chess PF1 Dose 003 Dose 003 Lab RC NAM SF Dem You may modify the settings for a site on this page. Manually created sites (not FinePointe Series sites) must be mapped to the appropriate legacy hardware. Choose a site to view its compatible hardware. NAM SF Dem NAM NAM SF Dem Series sites A.G. Configure Sites You may modify the settings for a site on this page. Manually created sites (not FinePointe Series sites) must be mapped to the appropriate legacy hardware. Choose a site to view its compatible hardware. NAM SF Dem NAM Series sites) You may modify the settings for a site on this page. Manually created sites (not FinePointe Series sites) must be mapped to the appropriate legacy hardware. Choose a site to view its compatible hardware. NAM SF Dem NAM Secies sites Type: Legacy Dosimetry Site PFT Table Type: Legacy Dosimetry Site Secies: Rabbit Site 1 Type: Legacy Dosimetry Site Species: Rabbit Site 1 Type: Legacy Dosimetry Site Secies 1 Red Babit Site 1 VBP Dem OS Secies 2 How Concentration Concentration WSP Dem OS Secies 3 Secis 4 Secies 3 Sec	Control	ler Home Page/	Hardware (Configurati	on Buxco	o FinePoint	e Control P	anel	
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Preamp Configuration					Preamp Co	nfiguration			j
Max II [SNDEMO-001]		Max II [SND	EMO-001]						
Cancel Back Next Finish					Cance	el Ba	ack	Next)	Finish

e. Click **Finish** to complete the Configuration Wizard.

Figure 6. This shows an example setup for Rabbit Site 1 which enables AeroMP support.

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6	Controller	Home Page/	Hardware (Configuratio	on Buxco	FinePointe	e Control P	anel			×
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PFT Lab PFT Rat		Site Label:	Rabbit Site 2	2	Ту	pe: Legacy	Dosimetry Sit	e			
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RC 2			F	ow			Concent	tration			
Tower 0000			(P			9				
WBP 000											
WBP Apnea WBP Demo St											
		Lead 1	Lead 2	Lead 3	Lead 4	Lead 5	Lead 6	Lead 7	Lead 8		
		Lead 9	Lead 10	Lead 11	Lead 12	Lead 13	Lead 14	Lead 15	Lead 16		
		Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8		
					Preamp Co	nfiguration					
		Max II [SNDE	MO-001]								
			_	_	Cance	Ba	ick	Next	Finish		
										9	
The SQL se	rver '\NINJA3' is ready to use.							Soft	ware Version:	2.3.1.23	

Figure 7. This shows an example setup for Rabbit Site 2 which enables AeroMP support. Note the TCP Listening Port is different from that on the other site.

CREATING A DOSIMETRY STUDY WITH FINEPOINTE

For studies utilizing Biaera AeroMP for aerosol control, a Dosimetry study is required to be configured prior to collecting data from the Dosimetry hardware in order to store the acquired data. A Dosimetry study can either be created directly or through the Universal study type. The following process will outline a Dosimetry study configuration using the Universal Study as it permits acquisition from any apparatus type (specified within the Create New Study wizard) and is more flexible with the reporting of data.

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To create a Dosimetry study using the Universal Study type:

1. Pull down the FinePointe selection under the Create Study Options header



Figure 8. Select Universal Study on the FinePointe pulldown.

- 2. Select Universal Study to launch the Create New Study wizard.
- 3. Page 1: General Creation Information

•			My Laboratory Buxco Fine	ePointe Review	- 🗆 ×					
G	eneral Actions	Laboratory Options Study	View Options Create Study Options FinePointe XA							
	40-		Create New Study - Univ	ersal Study	i i					
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		2 Configure CLP Settings	Study Name:							
	Demo	2. Configure GLF Settings	Dose 02							
		 Measurements and Phases 	Species: Rabbit							
		4. Configure Task	Select Apparatus	Name	A					
	63	Sequence								
			Diaphragm	Diaphragm						
	45512 IVNI		ECG	ECG						
			Transfer Impedance	Transfer Impedance						
			Input Impedance	Input Impedance						
			Konzett Rossler	Konzett Rossler						
			RC Pneumotach	RC Pneumotach						
			BP	BP						
			FDP	FDP						
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Serve	er: Joe's Server	User Name: Joe *		Status: Pruning - Suspended Software	Version: 2.3.1.23					

Figure 9. The first page of the Create Study Wizard.



- a. Enter a unique **Study Name**; e.g. Dose 02.
- b. Select the **Species** from the pulldown menu; e.g. Rabbit.
- c. Select **Dosimetry** as the Apparatus to use for the Study. (Required for use with Biaera AeroMP.)
- d. Click Next.

4. Page 2: Configure GLP Settings

If GLP options are enabled, this page permits the user to specify GLP options. This will not be covered in this technical note.

5. Page 3: Measurements and Phases

This page permits the addition, configuration, and arrangement of **Phases**. **Phases** are **Study Types** that may be executed against the subjects with the Study sequentially.



Figure 10. The new Measurements and Phases study page.





- **Technical Note**
- a. Add a **Phase** using the pulldown menu.

Note: At least one **Phase** is required.

b. In this example, the **Time Activity** Phase will be used.

6			My Labo	oratory Bux	co FinePointe F	Review				×
G	eneral Actions	Laboratory Options Study	View Options Cre	ate Study Option Pointe XA	IS V					
	400		Crea	ate New Study	- Universal Stud	iy				
Folders		1. General Creation Information	Arrange and con	figure the pha	ses of the study					
	Demo	2. Configure GLP Settings			_					
		3. Measurements and Phases	Common Meas	surement Duratio	(Time	Activity			
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			3 🔞	T30	00:30:00	00:05:00				
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	First Dose Response Pu	D Mouse			Cance	Back	Next	Finish		
Serve	er: Joe's Serve	r User Name: Joe*			S	tatus: Pruning - Suspe	nded	Software Version:	2.3.1.23	

Figure 11. The initial Time Activity phase settings.

The **Time Activity** Phase runs a protocol that performs the following:

- i. Allow the subject to acclimate to the apparatus for an optional acclimation period, typically 5 minutes.
- ii. Take a Baseline measurement with the duration specified here.
- iii. Wait for the operator to deliver or initiate delivery of a compound.
- iv. Once the operator has does so, press the "▶" button during data collection to signal the software to move to the next Phase of the Study protocol.
- v. From that moment, the system will take **Measurements** at the designated time points beyond the delivery.
- vi. Measurements may be modified based on the desired Study Design.



c. Click Next.

6. Page 4: Configure Task Sequence

This page permits configuration of automation settings that apply to all phases.



Figure 12. The final page of the Create Universal Study wizard.

a. (Optional) Define the acclimation period duration. The acclimation period may be ended early by pressing the "▶" button during data collection.

Note: The **Bias Flow** selection does not apply to this situation, so any setting is fine.

b. Click Finish to open the newly created Universal Study.



ACQUIRING DATA WITH FINEPOINTE

To begin running the experiment with FinePointe launch the data acquisition engine, Station. This will initiate the data acquisition process.

To launch acquisition:

1. Select the Launch Station pulldown under the Acquisition Operations header.

ry/Dose 02 Bux	co FinePointe	Review
Report (Options	Acquisition Operations
Create Report 🔻	Antagonist Report	Launch Station

Figure 13. The Launch Station pulldown button in the main Study page.

- 2. Choose the **Station** with the Hardware Configuration **Name** defined in Step 4 of the *Configure a Legacy Dosimetry Site* section. This will launch the **Configure Acquisition Session** wizard.
- Page 1: Configure Task Sequence
 This page is automatically skipped as the Task Sequence was previously defined as part of the Study
 Configuration (Step 6 of the Creating a Dosimetry Hardware Site section).
- 4. Page 2: Assign Subjects to Sites

The objective of this page is to specify subject IDs for each site. Only sites with defined Subject IDs will be run.



()	Configure Acquisition Sessi	on - Dose 001 S	tation	- 🗆 ×
 1. Configure Task Sequence 2. Assign Subjects to Sites 	Create new subject assignments is currently in use you will be as the current subject. If you need the Add button.	by selecting the ked to confirm the to add a new sul	appropriate subjects nat you want to stop o oject, enter the new su	below. If the site collecting data for ubject ID and click
3. Calibrate Selected Sites	Subject ID (Rabbit) Weight	Create Subject	Environme Bulk Add	ental Data Clear Assignments
	Site	Subject	ID Weight	
	Rabbit Site 1	type o	r drag 0	
	Rabbit Site 2	type o	r drag 0	
	Subjects Without Data		Subjects Wit	th Data
		Cancel	Back Ne	ext Finish

Figure 14. The first page presented when you launch a new data acquisition session. This page allows you to assign subject lds to each of the site in the hardware configuration.

For this demonstration:

- a. Type a Subject ID prefix in the Subject ID text box associated with the Site; e.g. "ID0".
- b. Click **Bulk Add**. FinePointe will automatically add unique **Subject IDs** to each site; e.g. "ID01" and "ID02".
- c. Adjust the Subjects' Weight.
- d. Click Finish.



•	Configure Acquisition Sessio	on - Dose 001 Station	_ 🗆 🗙
 1. Configure Task Sequence 2. Assign Subjects to Sites 3. Calibrate Selected Sites 	Create new subject assignments is currently in use you will be ask the current subject. If you need to the Add button. Subject Subject ID (Rabbit) Weight 2200 Site Rabbit Site 1 Rabbit Site 2	by selecting the appropred to confirm that you o add a new subject, er	Deriate subjects below. If the site want to stop collecting data for inter the new subject ID and click Environmental Data Clear Assignments Weight 2200 2200
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Figure 15. This shows the Configure Acquisition Session form populated with Subject IDs in each site: ID01 and ID02. Only sites with defined Subject IDs will be run.

- 5. The Summary window is presented and each Biaera AeroMP instance will automatically connect to their respective FinePointe site. Once connected, AeroMP will begin receiving tidal volume measurements.
- Press the "▶" button to begin data collection. To view a detailed window of a particular site, click the Arrow button circled in the picture below. A detailed view exists for each site.

Note: AeroMP will send notifications to FinePointe with aerosol delivery information. FinePointe will add these notifications as Event Marks to the data set and classify them as System Events.





Figure 16. The FinePointe Station Summary window showing 2 sites actively being acquired from.

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