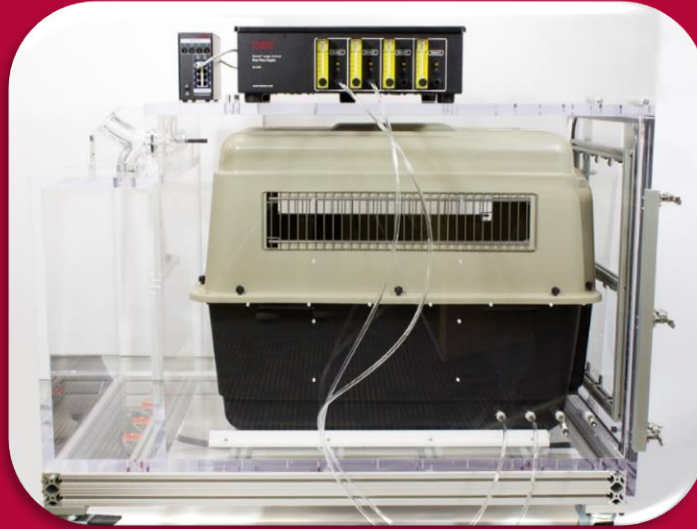


DSI FinePointe™

# Large Animal WBP Application Manual



*Note: Bias flow should not be placed on chamber during data collection.*



## OVERVIEW

This manual highlights how DSI's FinePointe Software and Large Animal Whole Body Plethysmograph (WBP) hardware interact as a system. This document will provide an overview of the system components, study creation, calibration, and data acquisition. It also includes detailed procedures on how to troubleshoot the system and properly maintain equipment.

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**DSI**™  
a division of  
**Harvard Bioscience, Inc.**

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## **FINEPOINTE WBP WELCOME**

Congratulations on joining the community of users worldwide who rely on DSI's products to perform preclinical physiologic research. Thank you for your interest in DSI products. We are committed to providing you with quality products and services.

This manual will help you get to know your FinePointe Whole Body Plethysmograph system for Large Animals. The structure of the manual was designed to sequentially guide you through using your DSI system from set up to data acquisition.

### **WHAT YOU WILL BE LEARNING**

1. Understand how respiratory data is collected using whole body plethysmography.
  - a. Hardware
  - b. Software
2. How to setup your whole body plethysmograph hardware.
3. How to use the FinePointe software to:
  - a. Create a hardware configuration
  - b. Create a study
  - c. Calibrate hardware
  - d. Acquire data
  - e. Generate reports
  - f. Review data

## SCIENTIFIC BACKGROUND

Since the pulmonary system is considered a vital organ, regulatory agencies require that respiratory parameters be evaluated for any new compound for unwanted adverse effects. The most common parameters to measure are the tidal volume and breaths-per-minute.

ICH S7A document refers to the following for testing the respiratory system:

### 2.7.3 Respiratory System

*Effects of the test substance on the respiratory system should be assessed appropriately. Respiratory rate and other measures of respiratory function (e.g., tidal volume (6) or hemoglobin oxygen saturation) should be evaluated.*

*Clinical observation of animals is generally not adequate to assess respiratory function, and thus these parameters should be quantified by using appropriate methodologies.*

## APPLICATION OVERVIEW

Whole Body Plethysmography (WBP) is an approach to measure respiratory function in conscious, freely moving animals. The system relies on a specially designed chamber in which the subject is placed and allowed to breathe under natural conditions, unrestrained, untethered, and without the use of anesthesia. The chamber is fitted with pneumotach screens which allow air to pass in and out of the chamber. The air resistance created by the pneumotach screens cause small pressure changes in the chamber relative to the ambient air. A sensitive pressure transducer measures these pressure changes inside the chamber, from which flow can be derived (called “box flow”).

Box flow is caused by two effects of breathing. The first effect is the expansion of air when the subject heats and humidifies the inhaled air and the contraction when the subject exhales since the air is cooled. This effect is called “conditioning”. The second effect is the expansion of air due to the negative pressure that develops in the lungs when the subject’s muscles force the inspiration. Expiration may create a positive pressure in the lung, and therefore cause some compression of the air in the lung during expiration.

Box flow is typically less than one tenth of the subject’s actual flow, so this flow measurement is very sensitive. DSI’s patented Halcyon™ pneumotach used with whole body plethysmography reduces atmospheric noise, making the measured signal as much as 20 times quieter. It cancels out noise by ensuring that both sensing ports on the differential pressure transducer measure the same pressure from an atmospheric event. As a result, artifacts due to a slamming door, facility air ventilation, or other air disturbances are minimized. The pneumotach is especially important for sensitive flow measurements required by whole body plethysmography. Without the Halcyon pneumotach this flow signal is easily overwhelmed by atmospheric noises.

The FinePointe software applies Boyles Law to the box flow and can derive estimates of the animal’s respiratory flow and volume. In addition, it can provide many other parameters including other tidal parameters, indications of bronchoconstriction or airway irritation, and cough analysis. The FinePointe software analyzes the incoming data and creates instant reports. If outfitted with a nebulizer, aerosol delivery of compounds can be performed.

The FinePointe WBP system comes complete with all required preamplifiers, nebulizer control circuitry, and integrated bias flow. This manual will take you through the basic setup of the hardware and usage of the system.

Alternatives to the whole body methods:

- A head-out chamber that restrains the animal and makes flow and volume measurements.
- Large animal jacketed external telemetry (JET) with respiratory inductive plethysmography (RIP).
- Thoracic Impedance Pneumography (TIP) using DSI's D70-PCTR telemetry device.

## ANIMAL SAFETY AND BIAS FLOW

Animals require a constant air supply when placed in a whole body plethysmograph. The level of bias flow (air supply) to each chamber is controlled by the user and flow rates are typically verified using a TSI Flow Meter. Please see the [Buxco Bias Flow Manual](#) for details on how to configure and run the model bias flow used in your setup.

It is important to start the bias flow prior to placing animals in plethysmographs. *This will ensure animals are receiving the proper level of bias flow.*



For safety purposes, do not place animals in a plethysmograph prior to starting the bias flow. See [Buxco Bias Flow Manual](#) for more information.

## SYSTEM COMPONENTS

Depending on what you purchased, your system may have some or all of the following components:



**Figure 1. FinePointe Large Animal WBP system component diagram.**

### 1 – Large Animal Bias Flow or Multi-Function Bias Flow (*not pictured*).

The Buxco Bias Flow pumps are used with plethysmographs and exposure chambers to keep fresh air available in the chamber for the subject to breathe. Utilizing a unique internal design, the unit ensures the flow is extremely quiet and minimizes noise introduced on the measured plethysmograph flow.

DSI offers a Multi-Function and Large Animal Bias Flow to accommodate the various flow requirements based on the number of subjects and sizes of subjects.

Chamber Type	Part Number	~Flow Capacity per site (LPM)	# of Independently Controlled Pumps	Flow Direction
<b>Multi-Function</b>	601-2201-001	0 – 2.5	4	Push or Pull
<b>Large Animal</b>	601-2200-001 (200 VAC)	0 – 20	4	Push or Pull
	601-2200-002 (100 VAC)			

See [Buxco Bias Flow Manual](#) for more information.

## 2 – QT Digital Preamplifier.

The QT digital preamplifier is used to acquire flow signals from up to 8 plethysmograph chambers via associated flow transducers. It may also be used to collect from up to 4 temperature/humidity probes and drive up to 4 Aerogen Aeroneb nebulizer heads.

## 3 - WBP Plethysmograph (up to 8 per QT).

Plethysmographs are designed to accommodate one subject each. The subject is placed in the plethysmograph and a flow transducer is connected. Bias flow tubing is also attached to the plethysmograph to provide fresh air to the subject while in the chamber. Depending on the type of study being conducted, a temperature/humidity probe or a nebulizer head is attached to the plethysmograph.

Available Chamber Size*	Typical Species
Large Chamber (pictured above)	Canine, Swine
Medium Chamber	Cat, Small Canine
NHP	NHP
Rabbit/Ferret	Rabbit/Ferret

\*Schematics with dimensions may be found in the Appendix **Chamber Dimensions** section.

## 4 - Flow Transducer (up to 8 per QT).

The flow transducer measures the pressure inside the plethysmograph. The pressure in the plethysmograph is linearly related to the flow of air moving in and out of the plethysmograph. The flow transducer accommodates temperature and humidity probe connections. Please note, although the QT supports up to 8 flow transducers, it only supports 4 digital temperature/humidity probes.

## 5 - Optional Digital Temperature and Humidity Probe (up to 4 per QT).

These consumable temperature and humidity probes measure the air temperature and humidity inside the plethysmograph. Real time measurements of temperature and humidity are used when conducting volume studies as they greatly improve the estimate of the subject's minute volume and tidal volume. This is an optional item and may not be part of your system. These sensors are expected to wear out over time, and as they do, the accuracy of the temperature and humidity values will degrade. A reference sensor should be used occasionally to verify the accuracy of the sensors used during acquisition.

## 6 – Optional Aerogen Aeroneb nebulizer head (up to 4 per QT).

These consumable nebulizers provide a means of nebulizing liquid compound and introducing it into the plethysmograph. Nebulizers are used when performing Airway Hyperresponsiveness studies (AHR) and may not be part of your system. It consists of a cup, a piezoelectric element, and an aperture plate with holes. When energy is applied, the plate vibrates rapidly, creating a micro-pumping action that generates a fine particle aerosol. It is capable of aerosolizing a broad range of formulations, including solutions, suspensions, small molecules, and macromolecules.

It is recommended to have two nebulizer heads per site for alternating use to allow for proper cleaning and drying without impacting the use of the system. The cable (not pictured) used to connect the nebulizer to the QT is also provided with the unit.

DSI offers a two different nebulizer heads based on particle size and nebulization rate:

- 601-2306-001: 2.5 to 4µm (purple) has a smaller particle size and a rate of approximately 100 µL/min.
- 601-2307-001: 4 to 6µm (gold) has a larger particle size and a rate of approximately 300 µL/min.

## **7 – In-line Dryers and Filters.**

The In-line Dryers are used to remove humidity from the air flow prior to reaching the bias flow. Humidity may be introduced through the subject's exhaled breath or if challenging the subject using nebulization. Filters are used to remove particles (e.g. dust, dander) from the air flow prior to reaching the bias flow. Adding dryers and filters is critical to protect the bias flow from being damaged by moisture/particle exposure.

## **8 - Controller Power Transformer.**

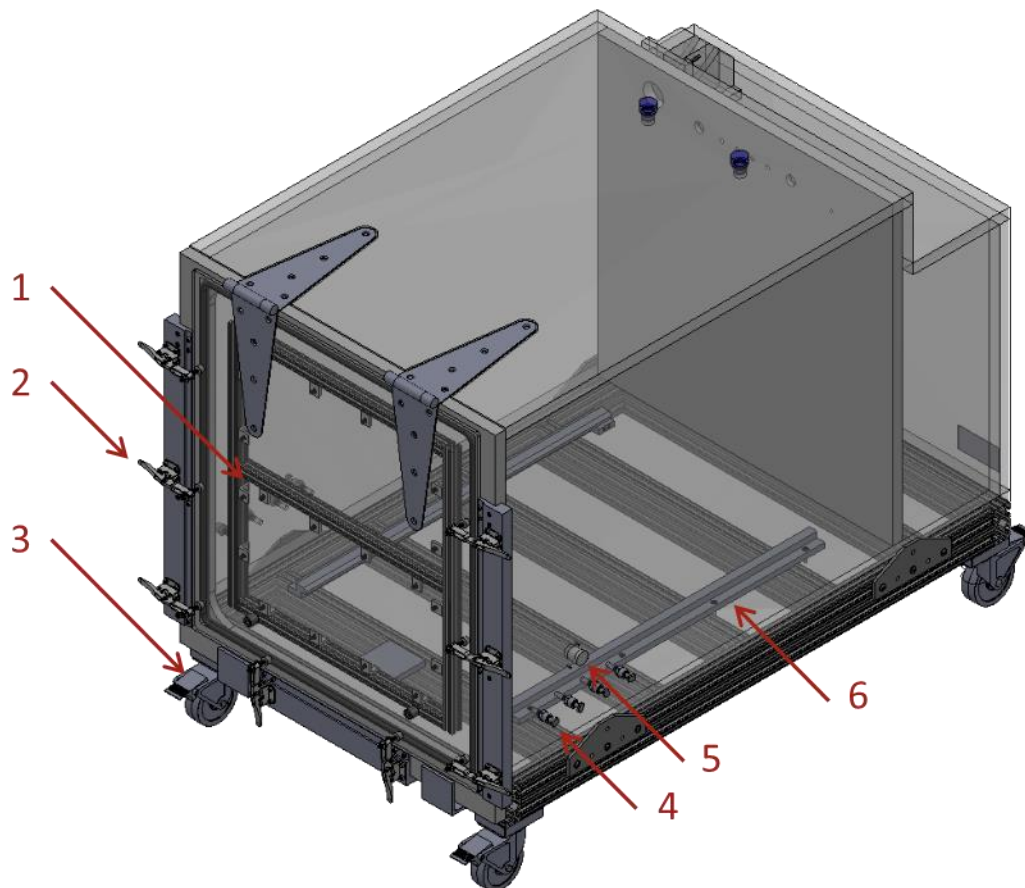
This provides power to the FinePointe WBP Controller.

## **9 – USB 2.0 Cable.**

The USB 2.0 cable (form A-Male to B-Male) connects the controller unit to the computer.

## UNDERSTANDING THE LARGE LA WBP CHAMBER

The WBP Plethysmograph contains multiple components to collect respiratory endpoints from unrestrained subjects. In this section, the form and function of the major chamber components are outlined. Please note, the animal crate provided with the system is not pictured below.



**Figure 2. Front facing (top) view of the Large WBP chamber with component callouts.**

### **1 – Door.**

The large front door provides easy access to the chamber for animal loading and chamber cleaning.

### **2 – Door Latches.**

8 robust door latches tightly seal the door shut once the animal is loaded.

### **3 – Locking Casters.**

The 4 locking casters provide easy chamber mobility around the lab when necessary.

#### 4 – Bias Flow Ports.

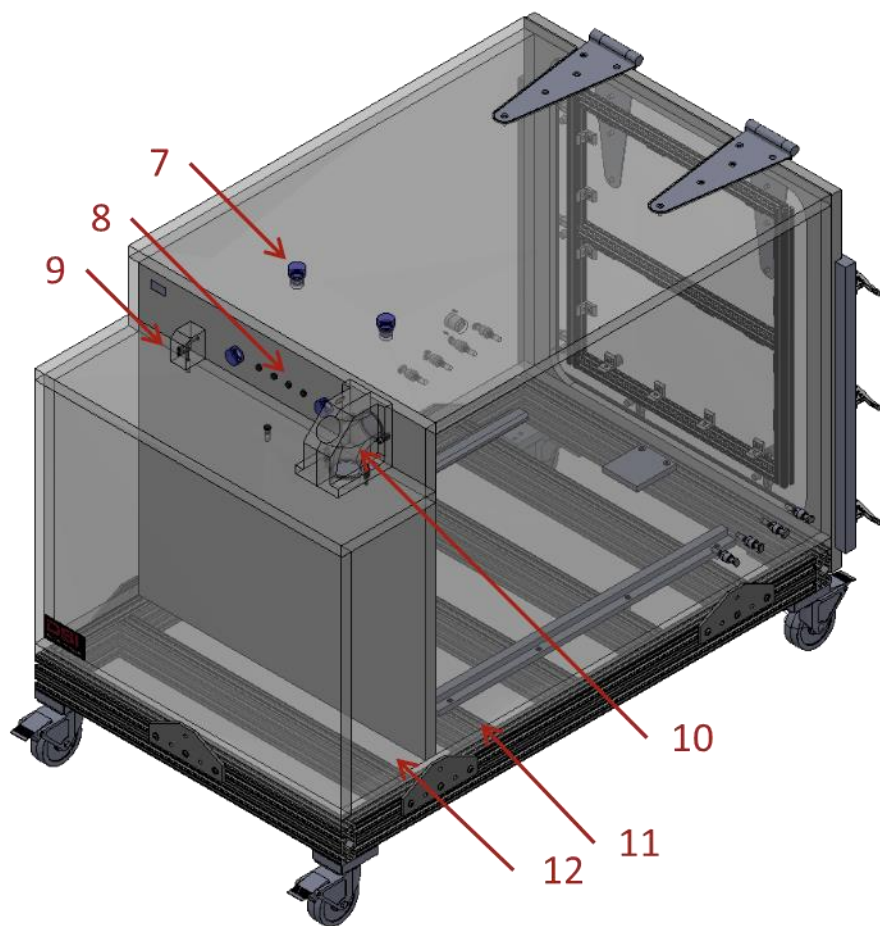
Ports used to connect Bias Flow tubing to the chamber. These 8 ports, 4 per side, permit flexible access to fresh air and efficient air exchange.

#### 5 – Accessory Port.

Generic chamber access port 1.0-inch (25.4mm) diameter with three 6/32 threaded screw holes surrounding it.

#### 6 – Floor Guides.

The floor guides help ease loading the crate and animal into the chamber.



**Figure 3. Rear facing (top) view of the Large WBP chamber with component callouts.**



## **7 – Chamber Access Ports.**

2 top and 2 rear mounted 22mm diameter ports are available to support the addition of temperature and humidity probes, nebulizers, or other exposure methods into the chamber.

## **8 – Rear Access Ports.**

4 ports with Luer fittings are available at the top, rear of the chamber to permit additional chamber access.

## **9 – Flow Transducer Ports.**

The flow transducer should be connected to these ports. Ensure the negative port is connected to the animal chamber.

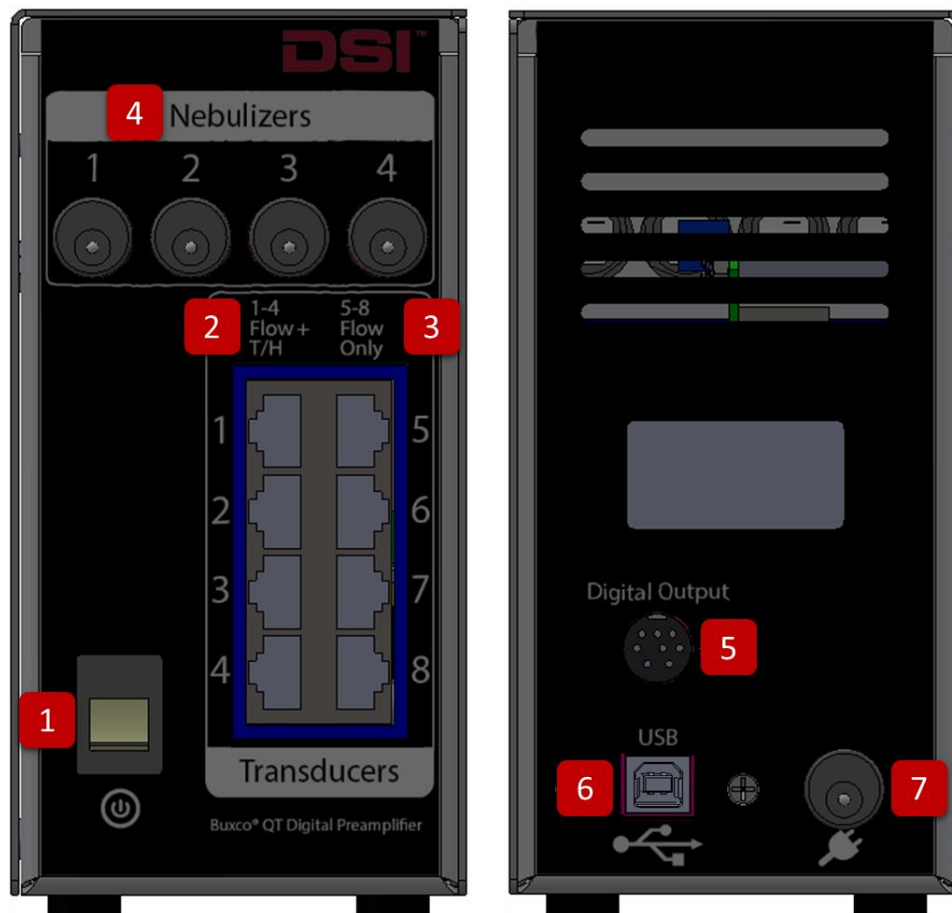
## **10 – Pneumotachs with Halcyon™ Technology**

When using plethysmographs to measure respiratory endpoints, the transducers are connected across the pneumotachs via the plumbing internal to the chamber. The pneumotachs house resistive screens positioned over the only exit/entry point through which air may flow in and out of the chamber as the subject breathes. The pneumotach permits the transducers to measure the changes in pressure inside the chamber as air flows through the resistive screens. These pressure changes are used to derive flow and volume signals once these transducers are calibrated using the process described in the **Calibration** section of this manual.

Most DSI Buxco plethysmographs, including the WBP chambers, are equipped with Halcyon pneumotachs. Halcyon pneumotachs cancel out noise by ensuring that the Negative sensing port (connected to **11. Animal Chamber**) and Positive sensing port (connected to the **12. Reference Chamber**) of the differential pressure transducer measure the same pressure from an atmospheric event. As a result, artifacts due to slamming doors, air ventilation ducts, or other air disturbances are minimized.

## UNDERSTANDING THE QT DIGITAL PREAMPLIFIER

The QT Digital preamplifier contains multiple inputs and outputs necessary to collect respiratory endpoints from unrestrained subjects. In this section, the form and function of these items are outlined.



**Figure 4. Illustrates the front (left) and rear (right) panels of the QT Digital Preamplifier.**

### 1 - Power Switch.

This is the main power switch to turn the unit on and off.

### 2 - Flow Transducer Inputs 1-4.

These 4 transducer inputs are used to monitor the flow signal from the plethysmography chambers. These 4 inputs are unique as they allow the digital temperature/humidity probe to be connected to the flow transducers.

### 3 - Flow Transducer Inputs 5-8.

4 additional transducer inputs are available to monitor the flow signal from additional plethysmography chambers. These 4 inputs, however, cannot be used to acquire from temperature/humidity probes attached to the flow transducers.

#### 4 - Nebulizer Inputs.

Multiple Aerogen Aeroneb nebulizers may be attached to these ports to generate and control aerosol delivery into the plethysmography chamber(s).

#### 5 - Digital Output Port.

The Digital Output Port is not currently used.

#### 6 - USB Port.

This USB port accepts a standard, non-powered USB cable which is then connected to the PC. All data acquired from the QT Digital Preamplifier and all control commands (from the PC) are sent through this connection.

#### 7 - Power.

Connect the power transformer here.

### HARDWARE SETUP

Hardware setup consists of the making the physical connections of the chamber and computer to the apparatus. In addition, the hardware must be configured within the software in order to calibrate the apparatus and perform data collections.

### CONNECT THE HARDWARE

Before setting up the apparatus, choose a location which has sufficient space for the QT Digital Preamplifier unit, power transformer, bias flow, and plethysmographs. The QT must be within reach (via USB Cable) of the PC to be used for data acquisition.

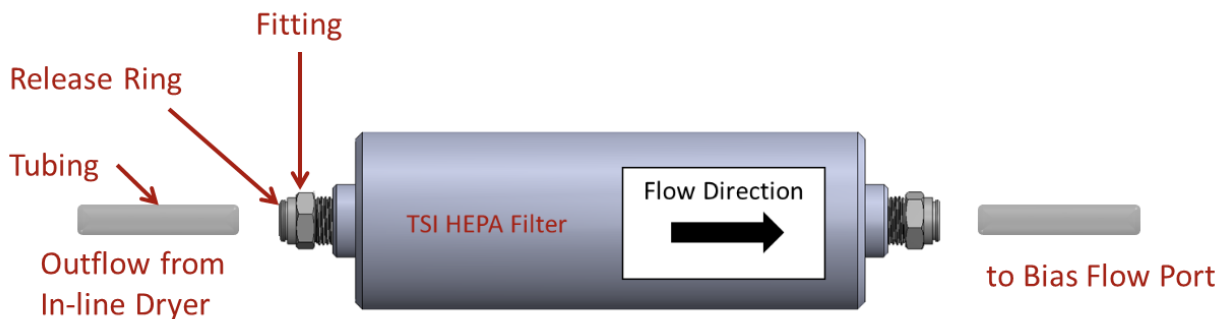
To setup the QT, perform the following connections:

1. Connect the USB cable to the USB Port. Connect the other end of the cable to an unused USB port on the PC.
2. Plug the power transformer into the back of the QT and connect the power cord from the transformer to a power outlet.

For each plethysmograph, perform the following connections:

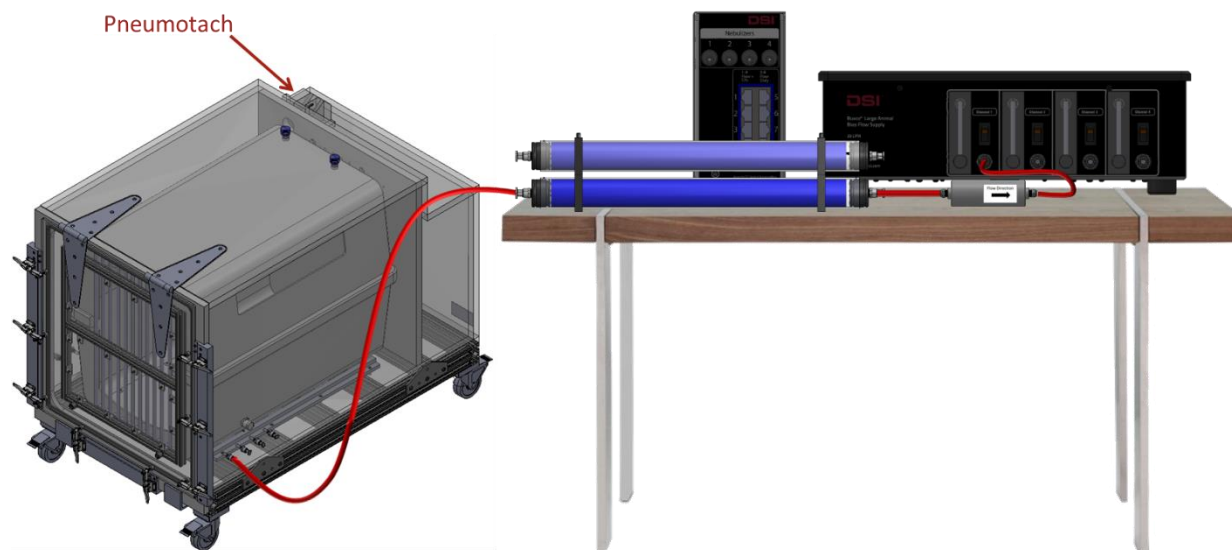
1. **Attach the Flow Transducers.**  
Connect the flow transducer to the chamber. Orient the transducer such that the negative port is connected to the animal side of the chamber. Connect the transducer cable into the desired Transducer input of the QT.
2. **Connect the bias flow.**  
*Note:* Bias flow should *NOT* be physically placed anywhere on the chamber.  
The schematic below outlines using the bias flow in the more common and recommend PULL direction. Push may also be achieved. Please see the [Buxco Bias Flow Manual](#) for details.

- a. Connect tubing from one of the bias flow ports on the bottom of the plethysmograph to an in-line dryer. Please ensure that the port used is not next to the Chamber Pneumotach.
- b. Connect tubing from the opposite end of the in-line dryer to a TSI HEPA Filter. Be sure to follow the flow direction sticker on the TSI HEPA filter when attaching the tubing to the filter. The arrow should be pointing toward the tubing going to the Large Animal Bias Flow. Connect the remaining filter port to the Large Animal Bias Flow port (front panel).



**Figure 5. Illustrates the flow direction and tubing connections for the TSI HEPA filter.**

The tubing connections should resemble the following:



**Figure 6. Illustrates the tubing connections between system components when using the PULL bias flow.**

3. **Attach nebulizer head.** (optional for aerosol delivery)

If aerosol is to be delivered, remove the desired 22mm Access Port plug from the plethysmograph and

replace it with an Aerogen Aeroneb nebulizer head. *Remove the translucent rubber cap from the nebulizer head prior to inserting into the chamber and discard.* Then connect the nebulizer cable from the nebulizer head to one of the QT's nebulizer inputs.

4. **Attach temperature and humidity probe.** *(if not aerosolizing)*

Remove the desired 22mm Access Port plug from the plethysmograph, replace it with a temperature and humidity probe, and connect the probe to the flow transducer.


Use the power button on the front panel of the QT to power up the system.

The first time you hook up your hardware, the operating system will automatically detect new hardware if the FinePointe software and Drivers have been installed.

## CREATE A HARDWARE CONFIGURATION

The FinePointe Control Panel is the administrator program used to manage the FinePointe system. Once the hardware is setup and connected to the PC, FinePointe Control Panel is used to configure the hardware within the software, enabling it to be calibrated and collect data.

Start by launching FinePointe Control Panel:

1. Double-click the FinePointe Control Panel desktop icon  or click **Start | All Programs | FinePointe** to launch the **FinePointe Control Panel** application.
2. Log in using your *Windows Administrator* account.

**Note:** FinePointe Control Panel may be accessed from any Windows User account, but it requires the use of a Windows Administrator username and password to log in and configure hardware apparatuses.

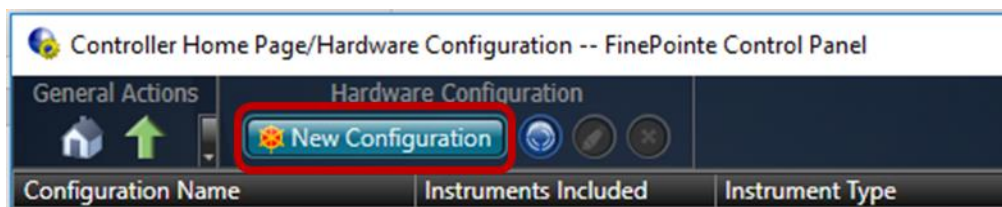
3. Click **OK** to continue.



- Click **Hardware Configuration** on the *Controller Home Page*.

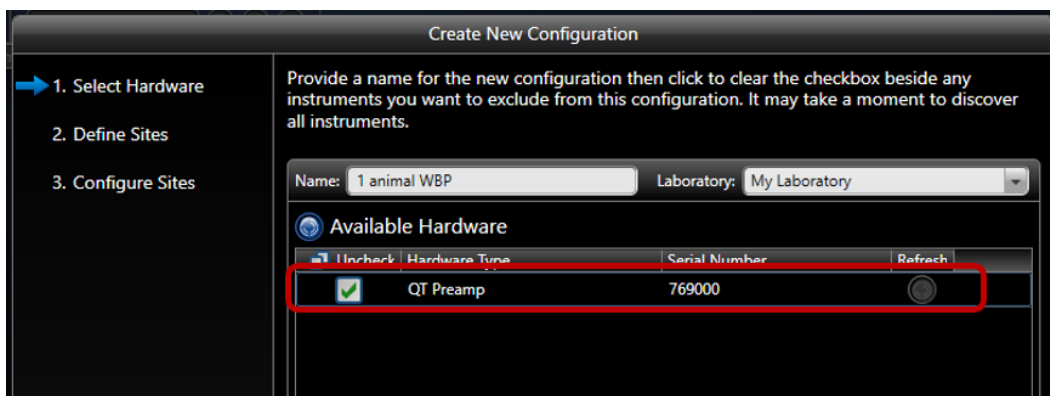


- Click the **New Configuration** button to launch the Configuration Wizard.



#### STEP 1 – SELECT HARDWARE:

- Type in a **Name** for your Configuration. For this example, we use “1 animal WBP”.
- Select the appropriate hardware that will be used for data collection. For this example, we use **QT Preamplifier** (serial number 819351).
- Click **Next**.



## STEP 2 – DEFINE SITES:

1. Use the *Chamber Type* dropdown to select **WBP Site**.
2. Select the *Species* to associate with the *Site*. For this example, **Dog** will be selected.

**Note:** The Species setting must be consistent across all sites being used. For example, you may not collect data from a Dog and a Rabbit at the same time. A separate Hardware Configuration should be created for each species.

3. Click the green plus icon to add the number of sites to the configuration necessary for the study, then click **Next**.

Create New Configuration

✓ 1. Select Hardware  
→ 2. Define Sites  
3. Configure Sites

The list below indicates the sites that will be included in this configuration. Sites associated with legacy devices (ie. MaxII) must be added manually.

Chamber Type: WBP Site Species: Dog

Site Name	Chamber Type	Species	Delete
Dog Site 1	WBP Site	Dog	

Cancel Back Next Finish

### STEP 3 – CONFIGURE SITES:

This page is divided into two sections:

- A. **Hardware sites (top)** – presents the hardware sites and definitions for the sites defined in Step 2. A tab is available for each site configured. In this example, only one site is being used.
- B. **Apparatus (bottom)** – presents the FinePointe hardware to be used, in this case the QT.

Create New Configuration

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.

**A**

Dog Site 1

Site Label: Dog Site 1 Type: WBP Site

Species: Dog ☐ Calibrate Box Flow for Cough

Box Flow Bias Flow Tchamber RHchamber BP Biopotential Telemetry Nebulizer Drier Gas A Gas B Gas Analyzer

**B**

Lead 1 Lead 2 Lead 3 Lead 4 Lead 5 Lead 6 Lead 7 Lead 8

Temp 1 Humidity 1 Temp 2 Humidity 2 Temp 3 Humidity 3 Temp 4 Humidity 4

Nebulizer 1 Nebulizer 2 Nebulizer 3 Nebulizer 4

QT1000 [SN 819351]

Cancel Back Next Finish

FinePointe requires the mapping the proper connection from the hardware site (top) to the apparatus (bottom). To map the connections:

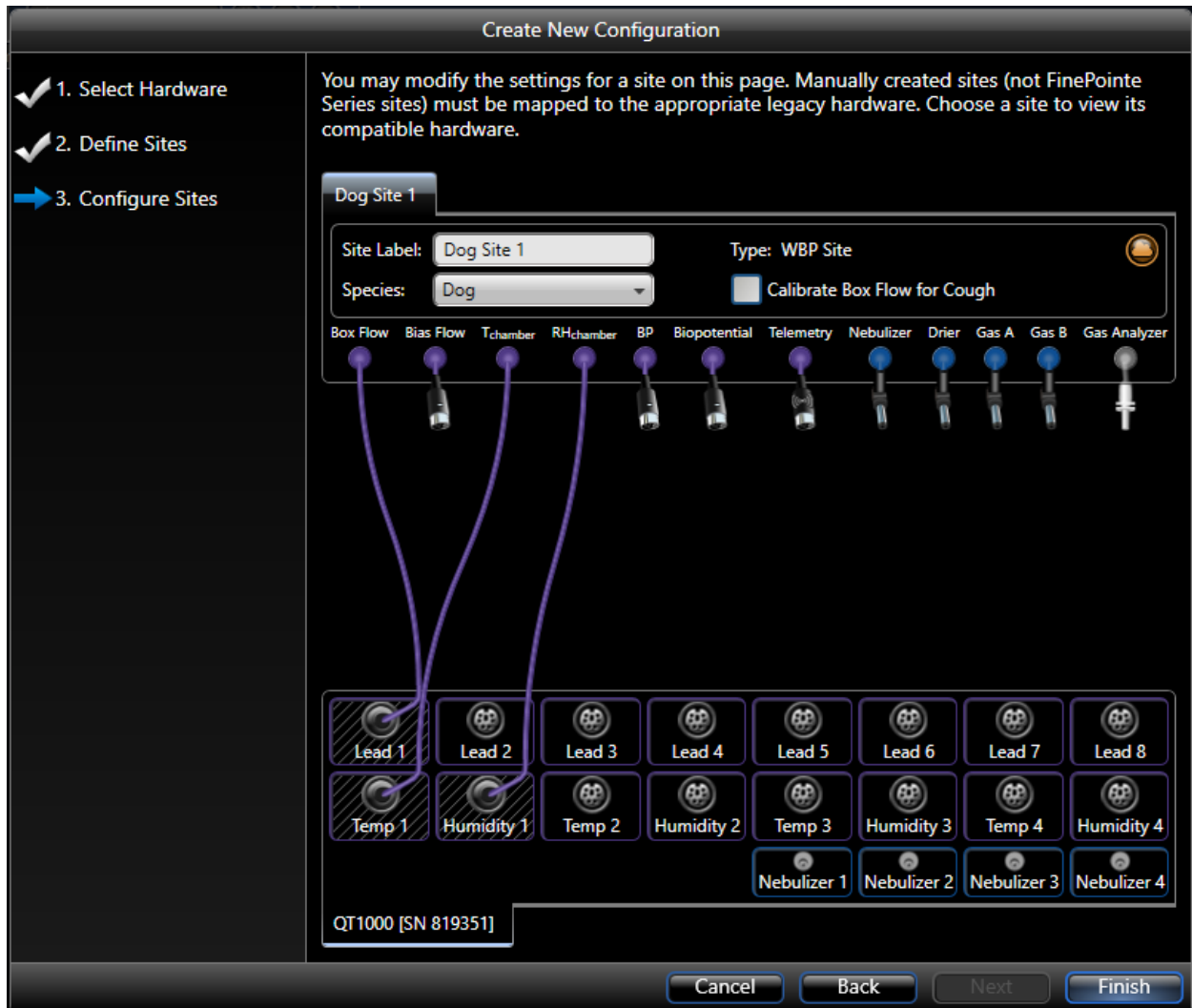
1. Left-click and drag the connector to the appropriate apparatus input.

Note: Leads 1 – 8 correspond to the Transducer inputs on the QT front panel. If using Leads 1 – 4 with temperature and humidity probes, the corresponding Temp1/Humidity1 – 4 inputs are listed in the

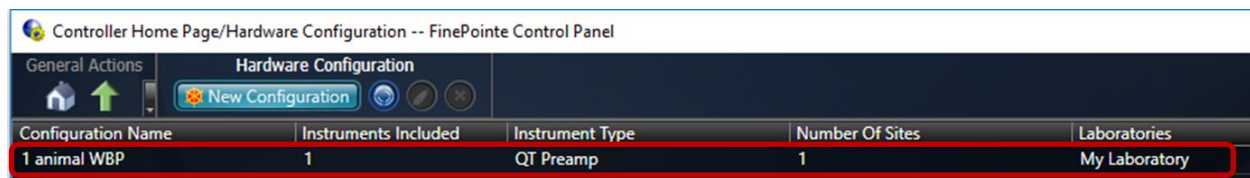


FinePointe dialog. Alternative, if using nebulization for AHR studies, the Nebulizer 1 – 4 connections in the dialog correspond to the Nebulizer 1 – 4 inputs on the QT.

In the example below, assume the temperature and humidity probe will be used.



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



3. Close the *FinePointe Control Panel*.

## NEBULIZER HEAD

The nebulizer head produces a uniform, fine droplet, low-velocity, highly respirable aerosol that is delivered to the test subjects. It consists of a cup, a piezoelectric element, and an aperture plate with holes. When energy is applied, the plate vibrates rapidly, creating a micro-pumping action that generates a fine particle aerosol. It is capable of aerosolizing a broad range of formulations, including solutions, suspensions, small molecules, and macromolecules.

The nebulizer head may be autoclaved and should be cleaned between each use.

DSI offers two different versions of nebulizer heads, one purple and one gold (pictured above).

DSI Part Number	Nebulizer Head Type	Particle Size ( $\mu\text{m}$ )	Approximate Nebulization Rate (ml/min)
601-2306-001	Purple	2.5 – 4	>0.1 Typical: 0.1 - 0.2
601-2307-001	Gold	4 – 6	>0.2 Typical: 0.3 - 0.5

Both nebulizers have a 10 mL capacity. This may be extended to 30 mL using the Extension Funnel (DSI Part Number: 012220-001).



**Figure 7. Nebulizer with 30 mL Extension Funnel.**

### Notes:

- The nebulizer head may be autoclaved and should be cleaned between each use. Please see the **Cleaning the Nebulizer Head** section to learn more.
- Over time, nebulizer performance may degrade. The system needs to correct for this degradation by applying more power to obtain the same aerosol, which is achieved through this recalibration process. Please see the **Nebulizer Head Efficiency Calibration** section for details on this process.

---

## DELIVERING AEROSOL FOR DOSE RESPONSE PROTOCOL

### DOSING

---

When loading the dose, carefully and slowly inject the solution in the center of the nebulizer head. Do not touch the membrane with the pipette. Pipette or inject compound in.

Use the white insert for larger doses.

The task sequence in the software will remind you to deliver these at the appointed times. Follow the software's direction.

### BETWEEN DOSES

---

At the completion of aerosol doses, you may see one or several puffs of aerosol coming out of the nebulizer head. These final puffs usually indicate that aerosolization is complete. There is nothing wrong with this; it is the action of the membrane in the nebulizer head.

### BETWEEN SUBJECTS

---

Between subjects, rinse the apparatus with water and dry it thoroughly. Allow the nebulizer to dry on its side. This prevents liquid from sitting on the aperture plate, extending the life of the device. Please see the **Cleaning the Nebulizer Head** section for more details.

It is vital to your data that you remove any Mch deposits that may exist.

If you are running several experiments a day, we recommend that you purchase an additional nebulizer head so that you can wash one while running another subject.

---

## TROUBLESHOOTING THE NEBULIZER HEAD

If a drop of liquid forms on the bottom of the micro-pump surface (the tiny dome shaped membrane in the center of the aerosol side of the nebulizer head), then it may fail to nebulize. Carefully dry the bottom surface with a paper towel by dabbing it.

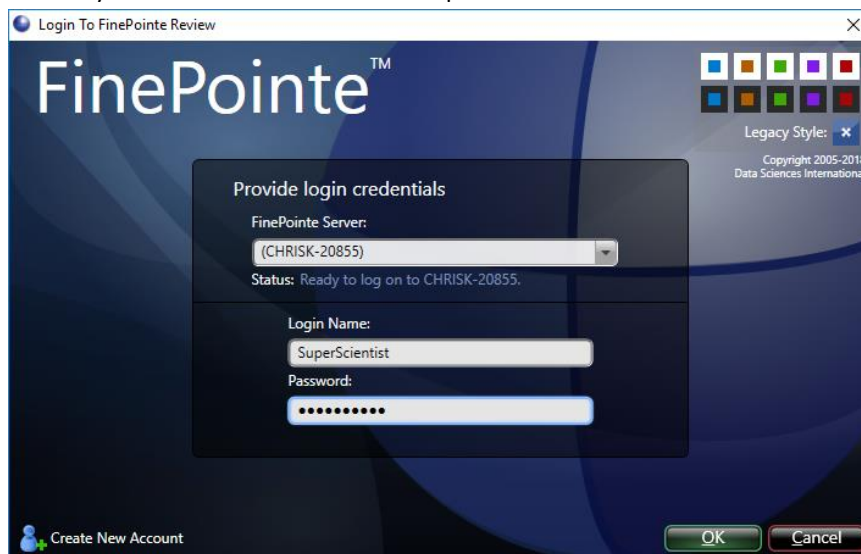
If you don't see any mist, and the unit has been on for at least 1 minute, there may be a problem. Please call DSI Technical Support for further assistance.

## FINEPOINTE SOFTWARE CONFIGURATION

Once the Hardware is configured, the FinePointe software will be used to calibrate the apparatus, create and manage studies, and collect, review, and report on study data.

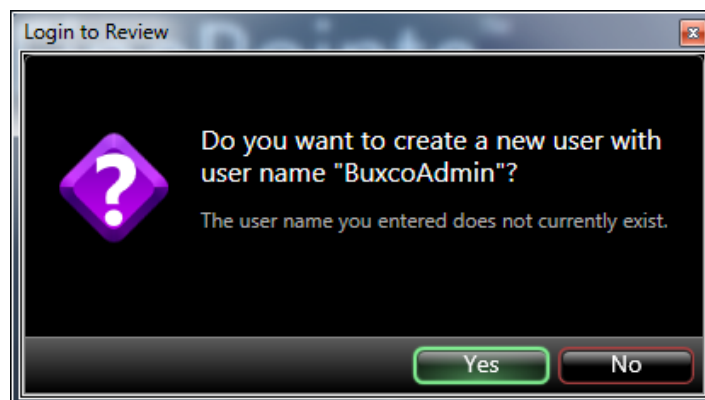
To launch FinePointe:

1. Either double-click the desktop icon or select **the Windows Start menu | All Programs | FinePointe | FinePointe.**
2. Log In using a previously created user or create a new user by entering an unused name.  
Choose your correct server from the drop down list.

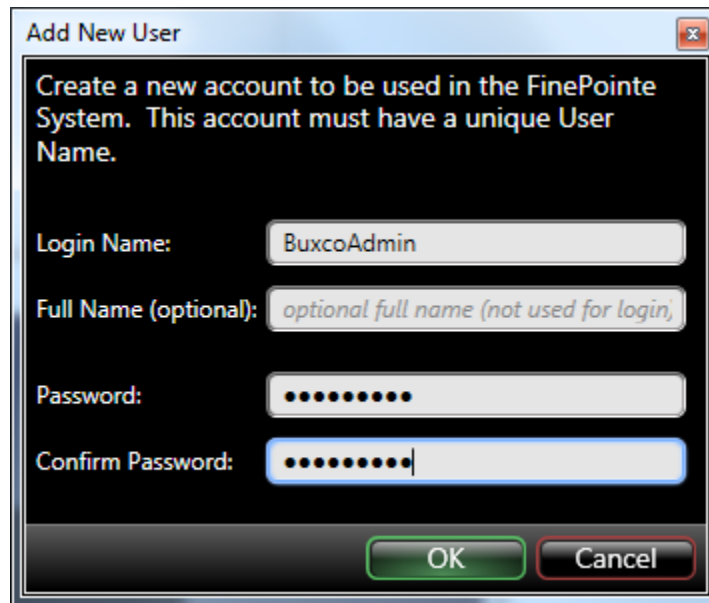


If logging in for the first time, a User ID may be created on the fly:

- a. Type in a user name and password. (The password is optional.) Click **OK**.
- b. Click **Yes** to confirm user creation



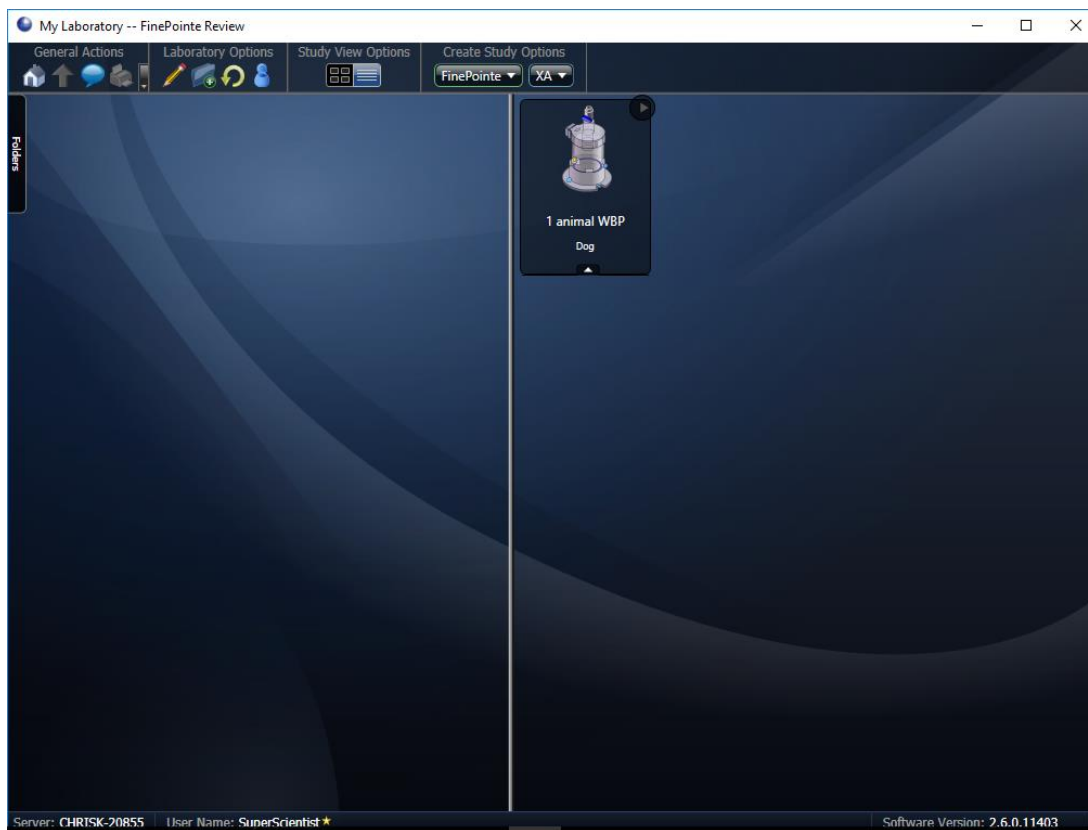
- c. Re-type the password to confirm it and click **OK** to finish creating the User ID. If standard operating procedures do not require a password, simply do not enter one and the new User ID will be created without a password.



The 'Add New User' dialog box has a title bar with a close button. The main text reads: 'Create a new account to be used in the FinePointe System. This account must have a unique User Name.' Below this are four input fields: 'Login Name:' with the text 'BuxcoAdmin', 'Full Name (optional):' with the placeholder text 'optional full name (not used for login)', 'Password:' with masked characters, and 'Confirm Password:' with masked characters. At the bottom are 'OK' and 'Cancel' buttons.

3. Click **OK** to continue.

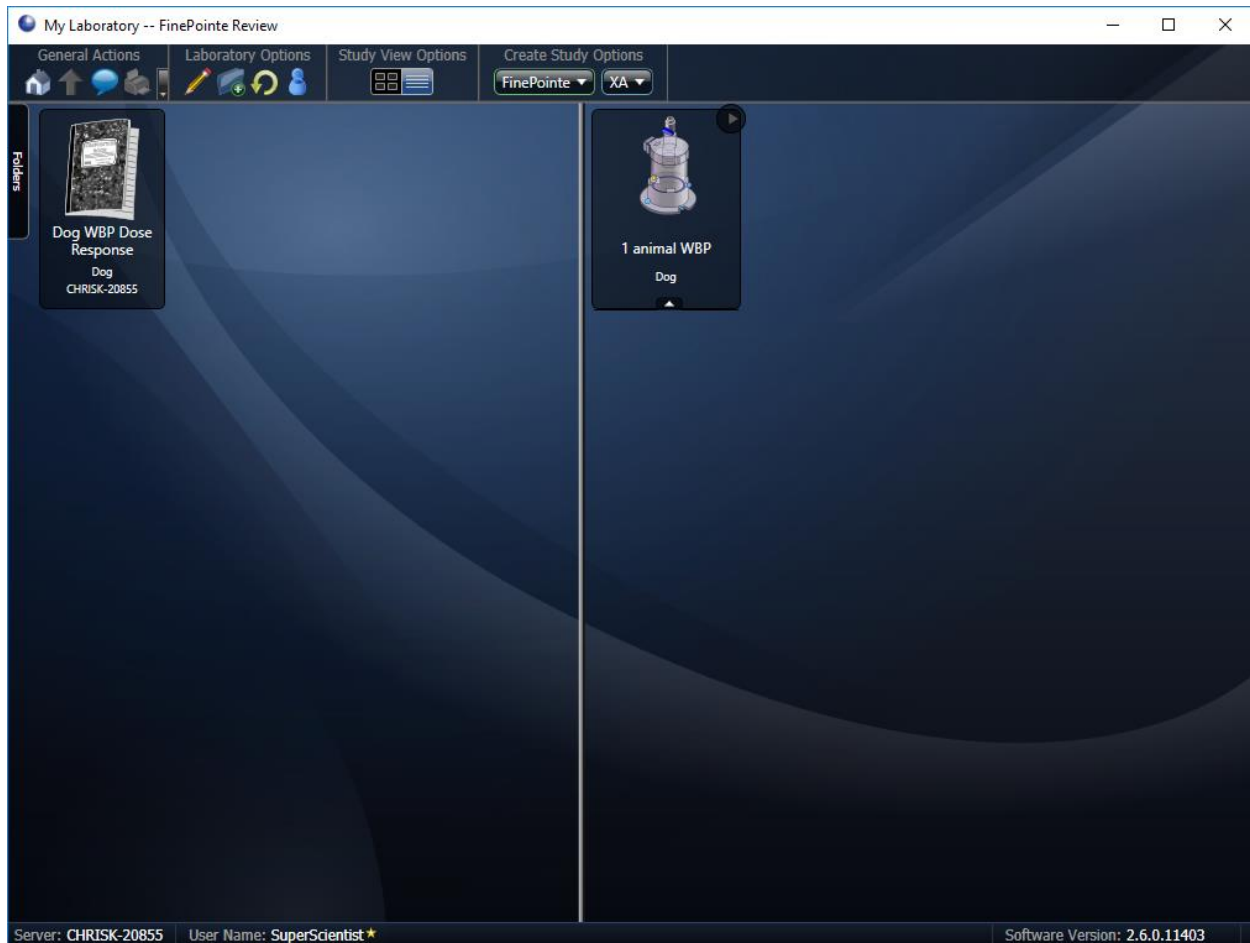
The first time the software is opened, an empty laboratory page will be presented, as displayed below:



**Figure 8. Displays the FinePointe software Home Page. Notice, the WBP hardware configuration is automatically loaded and available.**

Hardware configurations will appear on the right side of the screen. Recall, hardware configurations are created using the *FinePointe Control Panel* discussed earlier.

As studies are created, the left side of the page will fill with study icons.



**Figure 9. Example FinePointe software Home Page with Study folders on the left and Hardware Configurations on the right.**

Once FinePointe is launched, it is recommended to calibrate your hardware apparatus sites.

Use the power button on the front panel of the QT Digital Preamplifier to power up the apparatus.

## CALIBRATION

Use the following instructions to calibrate all of your sites.

**Note:** It is recommended to calibrate your WBP sites once per day, prior to the commencement of your acquisitions for that day.

Before you initiate calibration, please ensure the following:

1. No animal is in the plethysmograph.
2. The plethysmograph lid is properly attached to the base or the door is latched shut.
3. Perform all connections as described in the **Connect the Hardware** section of this manual.
4. Any unused ports must be closed or plugged to ensure no leaks occur within the chamber.
5. Ensure an applicable Hardware Configuration has been created and is visible on the FinePointe Home Page.

What you will need:

- 60 cc syringe
- Luer fitting
- Tubing

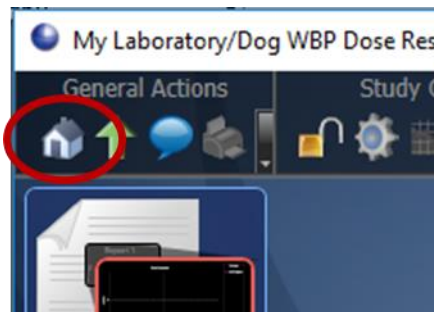
*Note:* These items are found in the **Large LA WBP Chamber Maintenance Kit**.

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### PLETHYSMOGRAPHY CHAMBER CALIBRATION

Once you have prepared the apparatus, perform the following to calibrate your WBP sites:

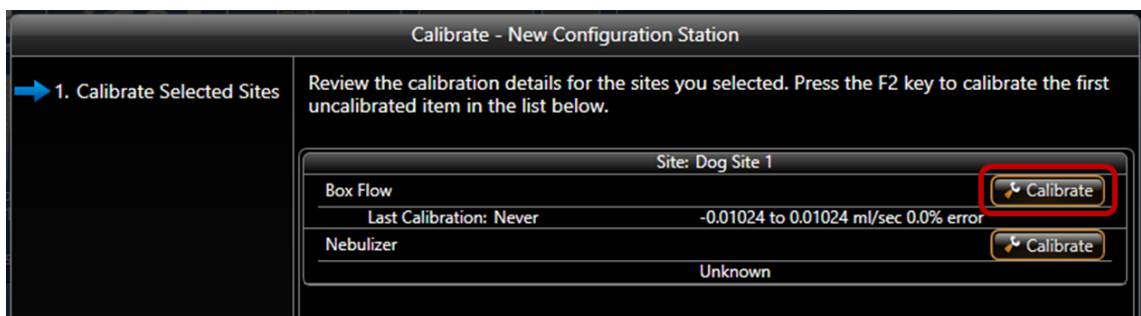
1. Open FinePointe, click on the **Home** icon to return to the lab page.



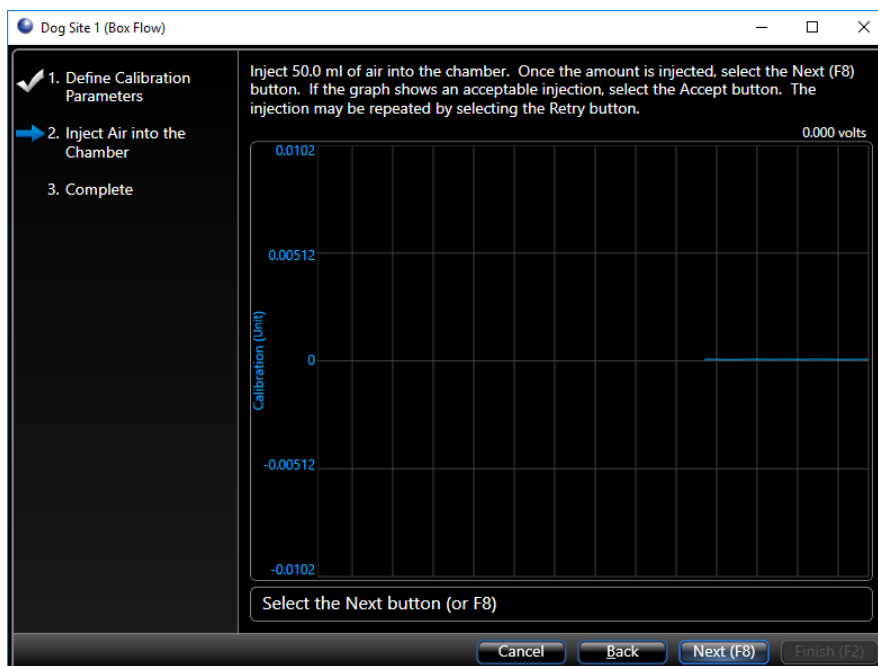
2. Find the appropriate hardware configuration located on the right side of the screen, hover the mouse over the hardware configuration, and click the **Calibrate** button (orange wrench) that appears to bring up the calibrate page.



- From the *Calibration* dialog that appears, click the **Calibrate** button associated with *Box Flow*. This will begin the calibration process.

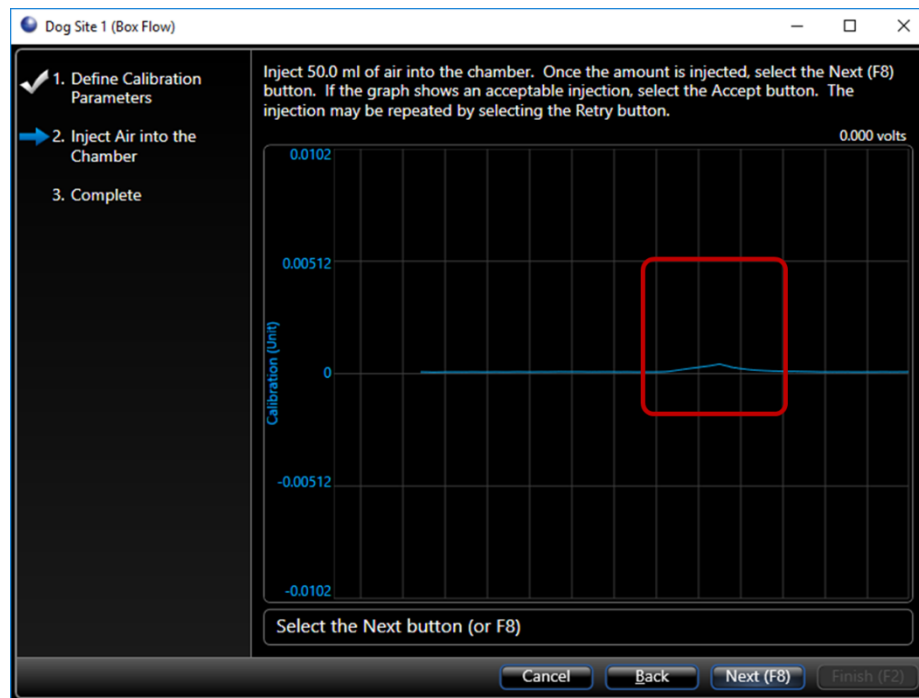


FinePointe will launch the Calibration dialog. This dialog includes the instructions necessary to calibrate the chamber:

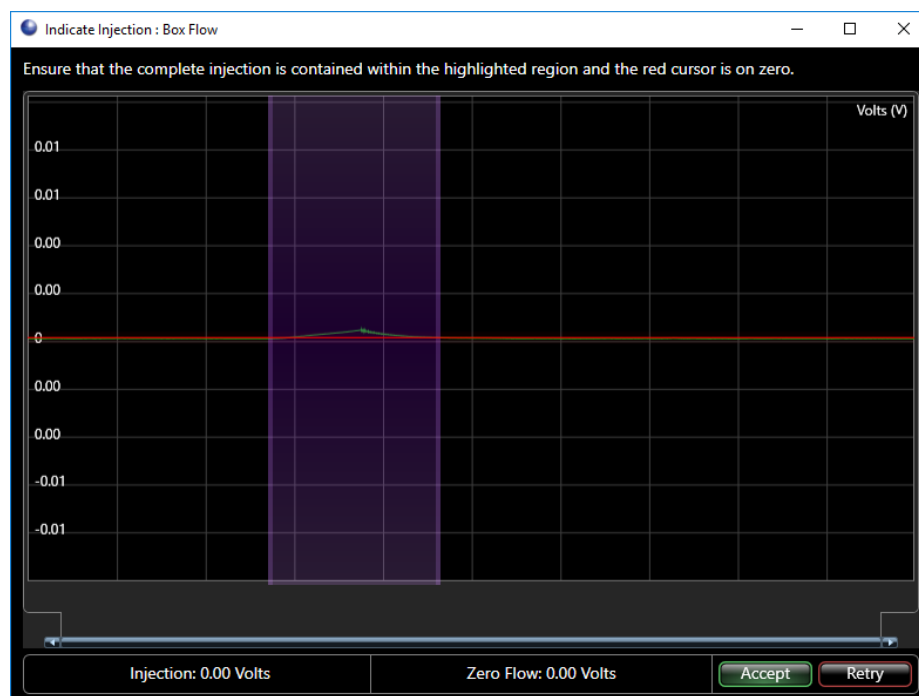




- a. Inject 50.0 mL of air into the chamber. A positive deflection in the signal should occur.



- b. Click **Next** or strike the <F8> key before the deflection scrolls out of view.
- c. Ensure the complete injection is contained within the highlighted region and the red cursor is on zero. Click-and-drag the heightened edges or the red cursor to adjust.



- d. Click **Accept** to complete the calibration or **Retry** to reinject the 50 mL of air into the chamber.
- e. The procedure is complete, and the High and Low Ranges are displayed. Click **Finish**.

Dog Site 1 (Box Flow)

1. Define Calibration Parameters ✓

2. Inject Air into the Chamber ✓

3. Complete →

The procedure is complete. Select Finish (F2) to save the calibration.

**Calibration Summary**

High Range: -3559 ml/Sec

Low Range: 3634 ml/Sec

Error: 0 %

Cancel Back Next (F8) Finish (F2)

4. The calibration dialog will update with the new calibration information. Click **Finish**.

Calibrate - 1 animal WBP Station

1. Calibrate Selected Sites →

Review the calibration details for the sites you selected. Press the F2 key to calibrate the first uncalibrated item in the list below.

Site: Dog Site 1

Box Flow

Last Calibration: 12/20/2018 8:55:22 AM 3634 to -3559 ml/Sec 0.0% error (Inverted)

Calibrate

Cancel Back Next Finish

**Note:** The temperature and humidity sensors should occasionally be checked for accuracy using the reference sensor provided. Please see the **Checking Temperature and Humidity Sensors** section of the Appendix for instructions.

If using nebulizers, ensure to calibrate the nebulizer head. Otherwise, create a WBP Study.

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## NEBULIZER HEAD EFFICIENCY CALIBRATION

Aerogen Aeroneb Heads provide a means for introducing controlled compound aerosols into the plethysmographs. Over time their ability to produce aerosol degrades. Proper care can extend the life, but eventually the performance will degrade to the point that they need to be replaced.

As the performance degrades, the system needs to correct for this degraded performance by applying more power to get the same aerosol. This is achieved by recalibrating the nebulizer heads for each site. The controller saves the calibration information specific to each site. Therefore, we highly recommend you label each nebulizer with the site number.

What you will need:

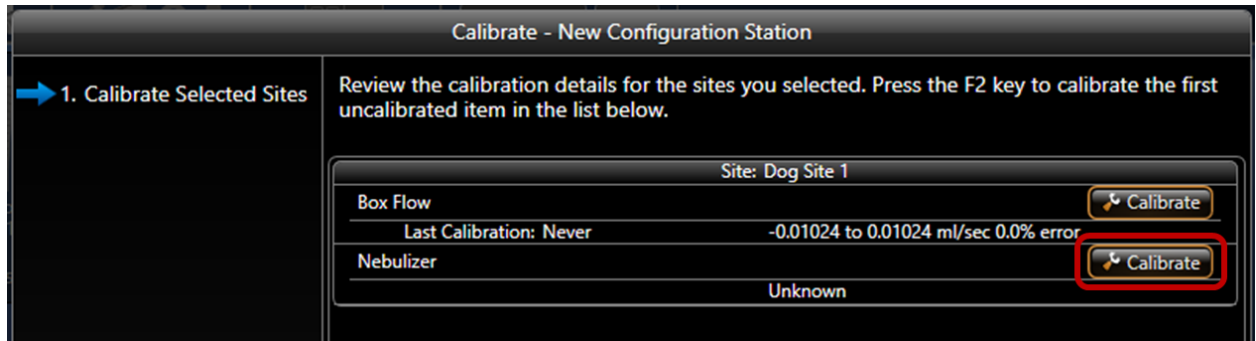
- A small flask of normal tap water
- 500uL pipette

To begin calibrating:

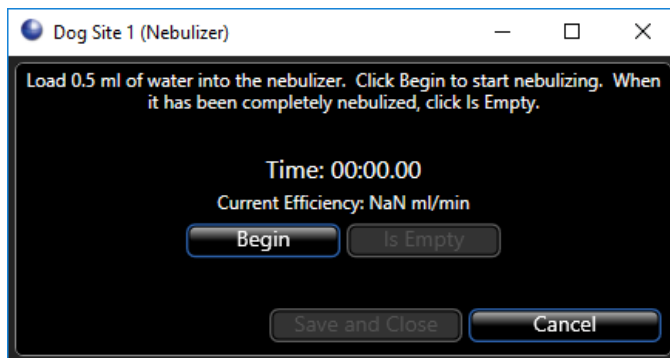
1. Start by powering on the QT Digital Preamplifier and connecting the associated chamber to the site.
2. Connect each nebulizer intended for calibration to their respective QT Digital Preamplifier Nebulizer sites and label each with the site number.
3. Select the first nebulizer head and make sure it is dry and free of any liquid inside. Hold it in your hand. You will need to watch the aerosol flow from the bottom of the head during this procedure.
4. Find the appropriate hardware configuration located on the right side of the screen, hover the mouse over the hardware configuration, and click the **Calibrate** button (orange wrench) that appears to bring up the calibrate page.



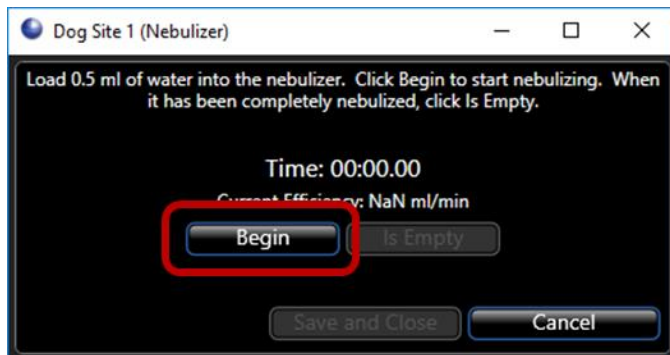
- From the *Calibration* dialog that appears, click the **Calibrate** button associated with *Nebulizer*. This will begin the calibration process.



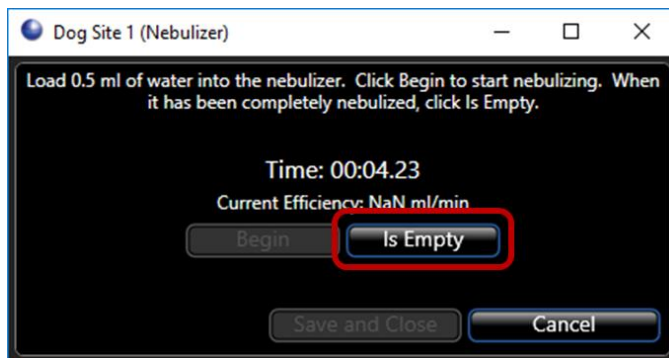
- The *Nebulizer Calibration* dialog will display the current calibration and instruct you to load 500uL of water into the nebulizer.



- Using the pipette, carefully measure 500uL of tap water from your flask, then slowly inject it into the center of the nebulizer head. Do not touch the membrane with the pipette.
- Click **Begin** to start nebulizing.

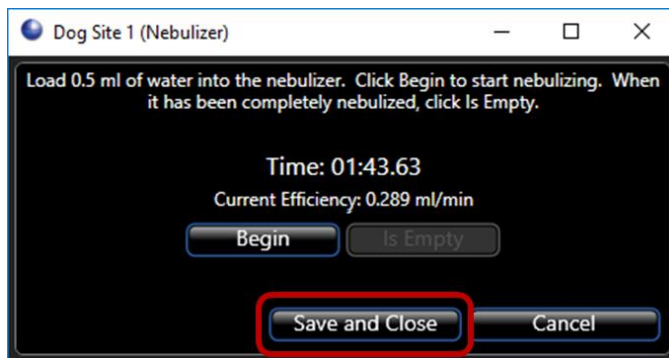


9. Watch the head carefully and press the **Is Empty** button when the mist has stopped.



10. The dialog will then display the updated Efficiency. Click **Save and Close** to save the value and exit.

For the gold neb heads, the rate should be *close* to 0.3 ml/min.  
For the purple neb heads the rate should be *close* to 0.1 ml/min.



11. Repeat these steps for any additional nebulizer heads.

Now that the system is calibrated, create a WBP Study.

## CREATING WBP STUDIES

There are several common uses for the WBP apparatus. The use dictates the procedure used to acquire the data and how you summarize the data. In FinePointe, the study type is what describes the use in the broadest terms. While the study types described here do not suggest the only way WBP data can be acquired and used, for the purposes of instruction in how to use the software it is very useful to focus on these.

The following table summarizes several different study types FinePointe offers to specifically assist you with acquiring and summarizing data for a given purpose:

FinePointe Study Type	Description
<b>Dose Response</b>	<p>Subjects are challenged with increasing doses of Methacholine (Mch), or some other bronchoconstrictor, and the response to the constrictor is quantified and data are presented as a dose response curve.</p> <p>This study type is used with most dose response studies where various dose concentrations are delivered over a single acquisition. Measurement periods associated with each dose challenge are placed automatically by the software based on user defined durations.</p> <p>With this type of study, users are not interested in measuring temperature and humidity in the chamber since the challenge increases pulmonary resistance.</p>
<b>Toxicity</b>	<p>Subjects are exposed to a compound and a respiratory response to this compound is monitored at discrete time points for an extended period.</p> <p>This study type is used with most toxicity studies where multiple Measurement periods are automatically placed by the software at user defined time points post dose; e.g. 5, 15, 30, 60, 120 minutes post dose.</p> <p>With this type of study, users generally measure temperature and humidity to improve the estimation of tidal parameters.</p>
<b>COPD</b>	<p>With a COPD study, it is common to acquire a single measurement of respiratory data every 2 weeks or so and create an extended time course over several months.</p> <p>These are longitudinal studies that occur in phases over time. Each acquisition is a single phase and each phase contains a single measurement, automatically placed based on user-defined durations. Once complete, these phases will be reported together over the time duration the study was conducted over.</p>
<b>Pilot Study</b>	<p>A pilot study is an ad-hoc study that may be used to determine the protocol of a later study. With this study, you may want to acquire data from a small set of subjects with very little structure.</p> <p>Use this study type if you are unable to define the specific details of your protocol. This study provides an open data collection protocol which does not place measurements for you. You are still able to produce reports, but it is up to you to <i>manually</i> place measurements.</p>
<b>Universal Study</b>	<p>This can be used for any of the studies described here. This study type is more flexible and provides more options, but may be more complex to use.</p>

The FinePointe software can assist you with the data collection and reporting of all these study types. In order to do so, you must create a study configured for the way you want the data acquired and reported. The study database is where all the acquired data is stored, reports are generated, and information about how data will be acquired.

The following sections outline how to create each of the study types listed above.

**Note:** Each time a study is created in FinePointe, you need to specify the apparatus you will be using with that study. The apparatus defines the signals that will be acquired and the analyzer tables that will be produced. It will also dictate aspects of your data collection protocol.

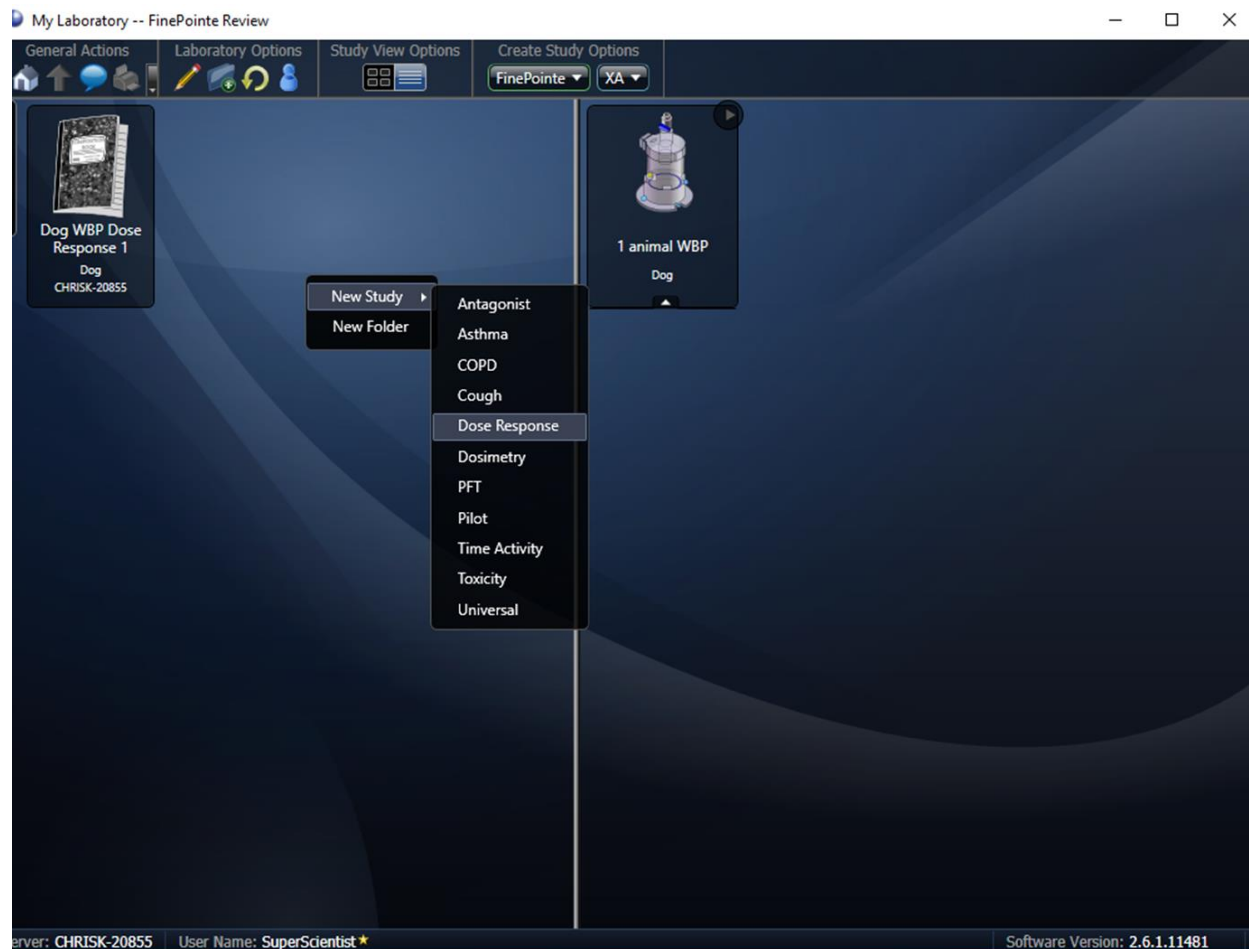
When performing study with the WBP system, the WBP apparatus must be selected.

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## CREATE A DOSE RESPONSE STUDY

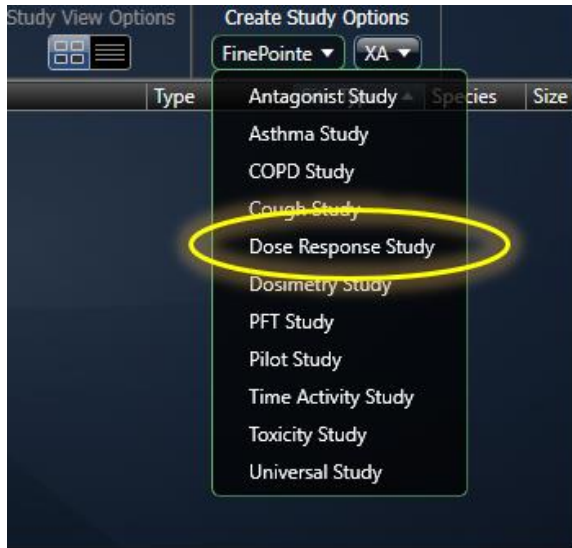
For this example, we will create a Dose Response study that is used when each chamber is using its own nebulizer head.

On the Home page, right-click anywhere on the left panel and choose **New Study | Dose Response**.



**Figure 10.** Displays the method used to create a New Study via right-click.

Or, you can use the **Create Study Options** along the top of the screen by clicking the FinePointe dropdown and choosing the **Dose Response Study** button.



**Figure 11.** Displays the Create Study Options. Click FinePointe and choose the appropriate study time; e.g. Dose Response.

The step by step study-creation wizard will open to guide you through the study creation process. Follow the steps in the Create New Study wizard.



## STEP 1 - GENERAL CREATION INFORMATION:

My Laboratory -- FinePointe Review

General Actions | Laboratory Options | Study View Options | Create Study Options

1. General Creation Information  
2. Configure Measurement Types  
3. Configure Parameters  
4. Configure Task Sequence

Enter your new Dose Response study details.

Study Name: WBP Dose Response

Species: Dog

Select	Apparatus	Name
<input checked="" type="radio"/>	WBP AHR	WBP AHR
<input type="radio"/>	WBP Volume	WBP Volume
<input type="radio"/>	Cough	Cough

Cancel Back Next Finish

Server: CHRISK-20855 User Name: SuperScientist Software Version: 2.6.1.11481

**Figure 12. Step 1 of the Create New Study dialog with the required sections filled out.**

In the first wizard page, you need to:

1. Type in a Study Name. For this example, we use “WBP Dose Response”.
2. Choose a species from the drop-down list. Here we chose “Dog”.
3. Click to select the appropriate set of apparatus, or hardware. Choose “WBP AHR”.
4. Click **Next**.

## STEP 2 – CONFIGURE GLP SETTINGS (OPTIONAL):

Create New Study - Dose Response

Choose whether this study follows GLP and fill the appropriate details.

☒ This study does not follow GLP

Objective:

Description:

☐ This study follows GLP

Cancel Back Next Finish

**Figure 13. Step 2 of the Create New Study dialog.**

This step is optional. If GLP options are enabled, this page permits the user to additional detail that may be required under a GLP environment. Click **Next** to continue to step 3. Please see ***FinePointe GLP Features User Guide*** for additional details.

## STEP 3 - CONFIGURE MEASUREMENT TYPES

The screenshot shows a software window titled "Create New Study - Dose Response". On the left is a sidebar with five steps: 1. General Creation Information (checked), 2. Configure GLP Settings (checked), 3. Configure Measurement Types (highlighted with a blue arrow), 4. Configure Parameters, and 5. Configure Task Sequence. The main area is titled "Select the dose list type and other details related to that type." It contains three radio button options: "Simple Dose List" (with subtext "Prefixed dose list."), "Geometric Dose List" (which is selected and highlighted with a blue box, with subtext "Dose list such as PBS, 1mg/ml, 2mg/ml, 4mg/ml, etc."), and "Semi-Logarithmic Dose List" (with subtext "Dose list such as PBS, 1mg/ml, 3mg/ml, 10mg/ml, 30mg/ml, etc."). Below these is a section titled "Geometric Dose List Details" containing two input fields: "Highest Dose:" with a value of "50" and a unit dropdown set to "mg/ml", and "Number of Doses:" with a value of "6". At the bottom are four buttons: "Cancel", "Back", "Next", and "Finish".

**Figure 14. Step 3 of the Create New Study dialog configured with typical settings.**

1. Choose a dose list type: Simple, Geometric, or Semi-logarithmic.
  - a. Simple Dose Names the doses with increasing indexes.  
Enter a name for the dose and enter the number of total doses (PBS included).
  - b. Geometric Dose Doubles each subsequent dose.  
Choose the high dose amount, the units, and the number of total doses (PBS included).
  - c. Semi-Logarithmic Dose Follows a common semi-logarithmic pattern.  
Choose the initial low dose, the units, and enter the number of total doses (PBS included).

Figure 14 shows a common choice, Geometric Dose ending at 50 mg/ml, for 6 total doses (PBS and 5 drug doses).

**How to choose?** In all cases you end up with a descriptive dose list. You can have the computer generate the list which you can then edit manually. Choose the pattern that most closely describes your sequence of doses. The next page allows you to edit the dose ids and concentrations, as well as specify parameters for the first report.

The dose list you choose helps populate the automatically generated *Task Sequence* list.

2. Click **Next** to continue.

#### STEP 4 - CONFIGURE PARAMETERS

The table below lists doses and parameters that are included in this report. To add a new dose, enter a name in the "new dose name" text field in the last row. Each dose name must be unique. If the report type is PC200 Dose Response, dose values must be in ascending order. A parameter must be created to proceed. To add the parameter, click the "New Parameter" button.

Delete	Measurement	Dose	
	PBS	0	
	3.125 mg/ml	3.125	
	6.25 mg/ml	6.25	
	12.5 mg/ml	12.5	
	25 mg/ml	25	
	50 mg/ml	50	
	new dose name		

Buttons: Cancel, Back, Next, Finish

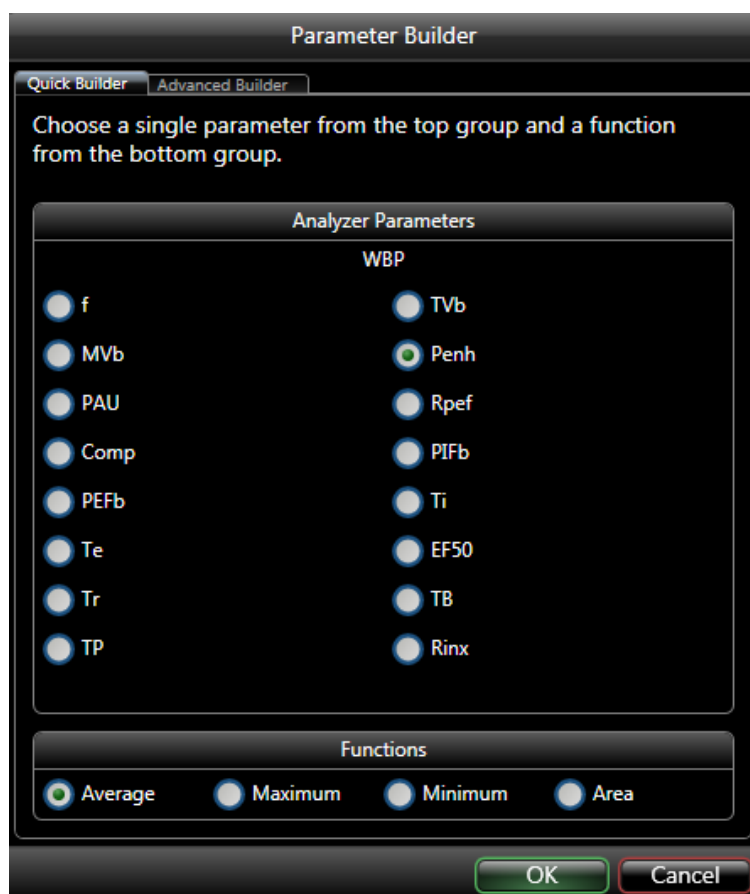
**Figure 15. Step 4 of the Create New Study dialog. Add a New Parameter used to create the initial report.**

This list reflects what you just chose as your list of doses. You can edit the Measurement and Dose columns or add additional Measurements by clicking in the empty **new dose name** field and typing in the next Measurement's name. The Dose is a numeric value which may be used if you generate certain reports such as PC-200 report. See **Reports** for more information about this report.

To finish this screen, you must create at least one parameter to display in the default Dose Response report.

**NOTE: Additional reports containing other parameters may be created later.**

1. Click the **New Parameter** button. This brings up the Parameter Builder.



**Figure 16. Parameter Builder dialog launched upon clicking the New Parameter button. Enhanced Pause (Penh) is a typical parameter selected for WBP reports.**

2. Click to choose one parameter from those listed.
3. Click to choose a function from the bottom of the screen.
4. Click **OK**.

**Create New Study - Dose Response**

- ✓ 1. General Creation Information
- ✓ 2. Configure GLP Settings
- ✓ 3. Configure Measurement Types
- ➔ 4. Configure Parameters
- 5. Configure Task Sequence

The table below lists doses and parameters that are included in this report. To add a new dose, enter a name in the "new dose name" text field in the last row. Each dose name must be unique. If the report type is PC200 Dose Response, dose values must be in ascending order. A parameter must be created to proceed. To add the parameter, click the "New Parameter" button.

Delete	Measurement	Dose	Penh	
	PBS	0	Avg	
	3.125 mg/ml	3.125	Avg	
	6.25 mg/ml	6.25	Avg	
	12.5 mg/ml	12.5	Avg	
	25 mg/ml	25	Avg	
	50 mg/ml	50	Avg	
	<input type="text" value="new dose name"/>			

**Figure 17. Step 4 of the Create New Study dialog with a parameter (Penh) added.**

The new parameter has been added as a column to this screen. In the example above, we have added the parameter Penh.

5. To add an additional parameter, click the **New Parameter** button again.
6. When you are finished adding parameters, click **Next**. You can add up two parameters in a Dose Response report.

## STEP 5 - CONFIGURE TASK SEQUENCE

1. Adjustments can be made to modify the task sequence.
2. Read through the task sequence options. They apply to acclimation time, aerosol volume, delivery duration, dose response duration and recovery before the next dose.
3. When you are finished with your selections, click **Finish**.

**Note:** Nebulizer heads lose their efficiency over time. We recommend entering an Aerosol Volume value that is actually double of what you intend to deliver. This will ensure the intended dose is delivered in full within the

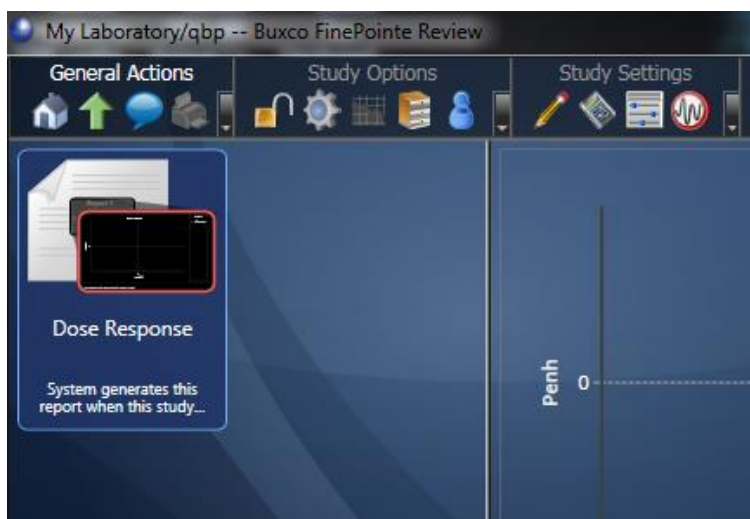
specified Delivery Duration. Please see **Nebulizer Head Efficiency** section for more information.

Example: if you intend to deliver 0.050mL (50µL) to the test subject, enter 0.100mL (100µL) in the aerosol volume section of the task sequence.

The screenshot shows a software dialog box titled "Create New Study - Dose Response". On the left is a vertical sidebar with five steps, each with a checkmark icon: "1. General Creation Information", "2. Configure GLP Settings", "3. Configure Measurement Types", "4. Configure Parameters", and "5. Configure Task Sequence". The fifth step is highlighted with a blue arrow. The main area of the dialog contains the heading "You may also make adjustments to the following task sequence options." followed by several input fields: "Duration of Acclimation period:" with a text box containing "00:05:00"; "Aerosol Volume:" with a text box containing "0.100"; "Nebulization Time:" with a text box containing "00:01:00"; "Response Time:" with a text box containing "00:03:00"; "Recovery Time:" with a text box containing "00:01:00"; and "Starting Bias Flow selection:" with a dropdown menu showing "Pull Bias Flow". At the bottom right are four buttons: "Cancel", "Back", "Next", and "Finish".

**Figure 18. Step 5 of the Create New Study dialog. Form permits users to augment the default task sequence.**

You will automatically be brought into the Study View. You will see an icon on the top left side of the screen indicating the system has just generated a default report for you with the parameter specified earlier.



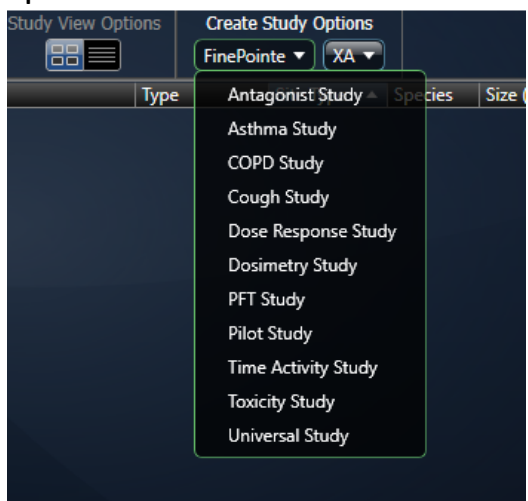
**Figure 19.** Once the Create New Study dialog is complete, the Study Page will visible with the Dose Response report for Penh available. Additional reports may be added later.

## CREATE A TOXICITY STUDY

Data collection for a Toxicity study is a single-phase data collection in which the operator delivers a compound and measurements are taken at specific time points following the compound delivery. The main report produced by this study is a time course, where time points are taken by separate measurements. Because each time point identified by its own measurement, you can manually adjust the positions of these measurements so that you report data only on quiet data.

The Toxicity wizard is a five-page wizard. The first two pages are very similar to the first two pages of other create study wizards.

To create the Toxicity study, begin on the Laboratory page and select **Toxicity Study** under the **Create Study Options**.



**Figure 20.** Select Toxicity Study by pulling down the FinePointe menu under Create Study Options.



This launches the Create Toxicity Study wizard.

## STEP 1 – GENERAL CREATION INFORMATION

My Laboratory -- FinePointe Review

General Actions Laboratory Options Study View Options Create Study Options

1. General Creation Information  
2. Configure Term Time Points  
3. Configure Parameters  
4. Configure Task Sequence

Create New Study - Toxicity

Enter your new Dose Response study details.

Study Name:  
Toxicity 01

Species:  
Dog

Select	Apparatus	Name
<input checked="" type="radio"/>	WBP AHR	WBP AHR
<input checked="" type="checkbox"/>	WBP Volume	WBP Volume
<input type="radio"/>	Cough	Cough

Cancel Back Next Finish

Server: CHRISK-20855 User Name: SuperScientist Software Version: 2.6.1.11481

**Figure 21.** The first page of the Create Toxicity Study wizard.

In the first wizard page, you need to:

1. Type in a Study Name. For this example, we use “Toxicity 01”.
2. Choose a species from the drop-down list. Here we chose “Dog”.
3. Click to select the appropriate set of apparatus, or acquisition hardware. Choose “WBP Volume”.
4. Click **Next**.

## STEP 2 – CONFIGURE GLP OPTIONS

Create New Study - Toxicity

✓ 1. General Creation Information

➔ 2. Configure GLP Settings

3. Configure Term Time Points

4. Configure Parameters

5. Configure Task Sequence

Choose whether this study follows GLP and fill the appropriate details.

☒ This study does not follow GLP

Objective:

Description:

☐ This study follows GLP

Cancel Back Next Finish

**Figure 22. The second page of the Create Toxicity study wizard.**

Like with the other studies, you can indicate if this study will follow GLP. If so, FinePointe imposes requirements consistent with GLP and enables digital signatures. Please see ***FinePointe GLP Features User Guide*** for additional details.

Click **Next**.

### STEP 3 – CONFIGURE TERM TIME POINTS

Create New Study - Toxicity

Configure the time point for each term measurement below. After a term is deleted, update the term numbering by selecting the refresh button.

Baseline Measurement Name:  
Baseline

Term Prefix:  
T

+ Add More Terms

Terms	Time Point (hh:mm:ss)	Delete
1	00:05:00	
2	00:10:00	
3	0:30:00	
4	01:00:00	
5	02:00:00	
6	03:00:00	
7	04:00:00	
8	This item has been deleted	Undo
9	This item has been deleted	Undo

Cancel Back Next Finish

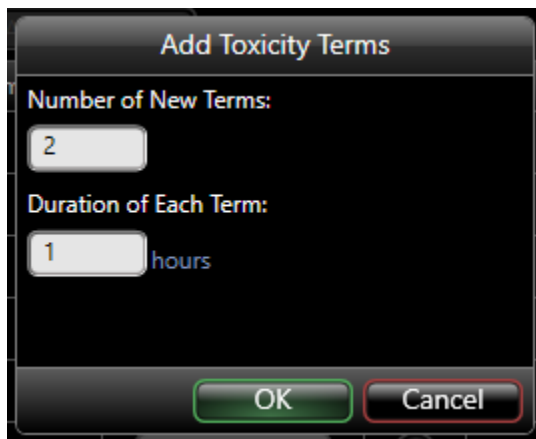
**Figure 23.** The third page of the Create Toxicity Wizard. Here you define the time points FinePointe will acquire.

On the third page, define the time points at which to place measurements. Measurements are placed so that the end of the Measurement will be at the designated Time Point. FinePointe samples a baseline prior to delivering the compound or subjecting the animal to a stimulus.

1. Optionally, edit the measurement name of the baseline. In addition, each time point is given an identifier which consists of the Term Prefix (specified here) and the number of hours since the compound is delivered.
2. Each row in the table describes a time point.
  - a. To add additional time points, click the green **Add More Terms** button.



This button presents a form which allows you to add a group of evenly space time points.

A dialog box titled "Add Toxicity Terms" with a dark background. It contains two input fields: "Number of New Terms:" with the value "2" and "Duration of Each Term:" with the value "1" followed by the text "hours". At the bottom, there are two buttons: "OK" and "Cancel".

*Figure 24. This form is presented when you click Add More Terms. You can specify the number of time points (Terms) and the duration of each.*

- b. Delete any time point by clicking the corresponding red x.



3. Once satisfied the list of time points, click **Next**.

## STEP 4 - CONFIGURE PARAMETERS

Measurement ID	Time Point (hh:mm:ss)	TVb	
Baseline	00:00:00	Avg	
T 0.083	00:05:00	Avg	
T 0.167	00:10:00	Avg	
T 0.500	00:30:00	Avg	
T 1.000	01:00:00	Avg	
T 2.000	02:00:00	Avg	
T 3.000	03:00:00	Avg	
T 4.000	04:00:00	Avg	

**Figure 25.** The fourth wizard page of the Create Toxicity wizard. Here you specify a parameter to be summarized in the initial report.

On the fourth wizard page, specify one parameter to be summarized in the initial report. As you can see, each measurement is named by FinePointe, and you can see that name on this page. For example, “Term 0.500” is given to the measurement taken 30 minutes after the delivery.

1. Click New Parameter button.
2. Select the parameter of interest.
3. Click **Next**.

## STEP 5 – CONFIGURE TASK SEQUENCE

**Create New Study - Toxicity**

✓ 1. General Creation Information  
✓ 2. Configure GLP Settings  
✓ 3. Configure Term Time Points  
✓ 4. Configure Parameters  
➔ 5. Configure Task Sequence

You may also make adjustments to the following task sequence options.

**Duration of Initial Baseline Recording:**  
Specify the duration to record data before intervention (hh:mm:ss).  
01:00:00

**Baseline measurement duration:**  
Enter the duration of the baseline measurement (hh:mm:ss).  
00:15:00

**Term measurement duration:**  
Enter the duration of each Term measurement (hh:mm:ss).  
00:05:00

**Starting Bias Flow selection:**  
Specify the Bias Flow mode to be selected before and after the experiment.  
Pull Bias Flow

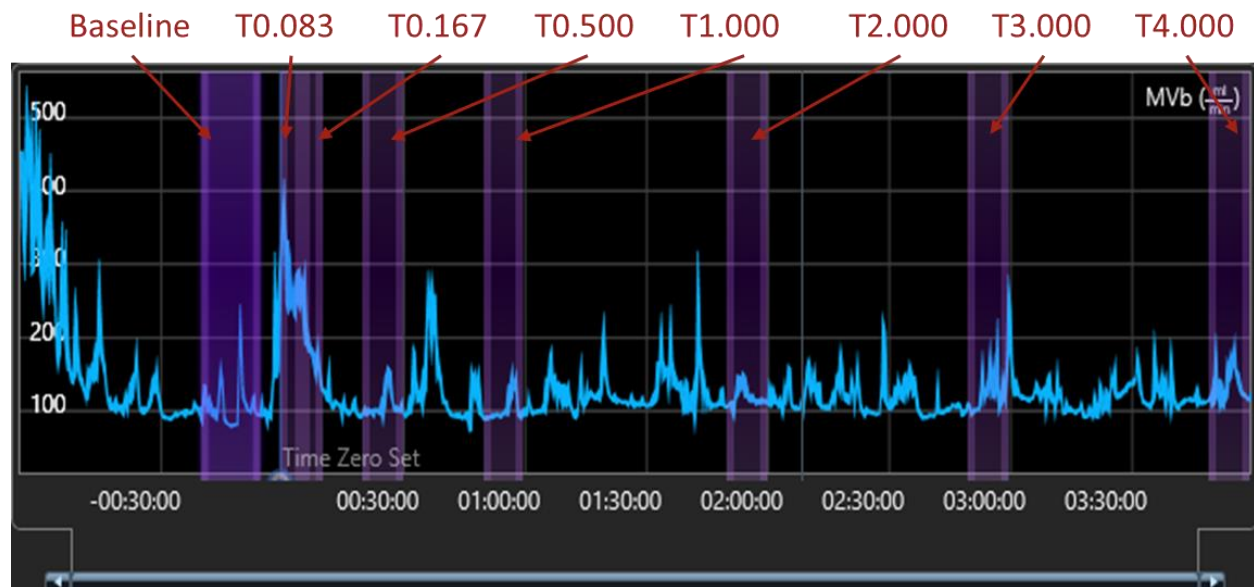
Cancel Back Next Finish

**Figure 26. The final page of the Create Toxicity Study wizard.**

This is the final page of the create Toxicity study wizard. On this page, you can set certain settings which dictate how the data is collected.

Prior to delivering the compound, data is recorded (during the Initial Baseline Recording, the duration of which is specified above), and at the end of that recording, a baseline measurement is placed. Generally, you will record data for a longer period of time than the baseline measurement. This permits you to adjust the position of the baseline measurement later to ensure the data marked by the measurement is most representative. Shown here, the baseline period is 1 hour, and the measurement is 15 minutes long. The measurement will be placed at the last 15 minutes of the hour-long baseline period.

Following this baseline recording, FinePointe waits for you to deliver the compound. Once delivered, FinePointe continues the recording and begins placing measurements at the time points you defined in previous steps. Shown here, the duration of each of these measurements is 5 minutes. See Figure 27 for an illustration of the placement of measurements.



**Figure 27.** This shows example automated placement of measurements within a recording.

Once the form is completed, click **Finish**.

## CREATE A COPD STUDY

Data collection for a COPD study involves performing data collection from the same subject every couple of weeks, and then only taking one measurement per acquisition (called a **phase**). Each measurement is identified with a measurement ID which then enables you to create a chart of lung property versus measurement.

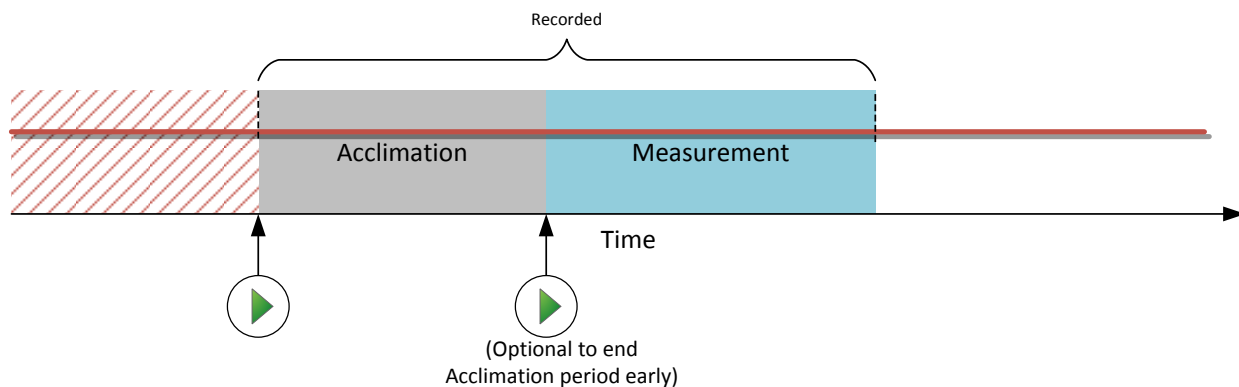
The COPD wizard is a four-page wizard. The first two pages very similar to the first two pages of other create study wizards. On the third page, you specify the measurements you intend to take. FinePointe automatically creates a separate phase for each measurement you define on the third page.

For example, you may want respiratory rate measured every 2 weeks for each subject. This study would produce a table that looks something like:

Subject	Week0	Week2	Week4	Week6	Week8	Week10
S01	XX.XX	XX.XX	XX.XX	XX.XX	XX.XX	XX.XX
S02	XX.XX	XX.XX	XX.XX	XX.XX	XX.XX	XX.XX
S03	XX.XX	XX.XX	XX.XX	XX.XX	XX.XX	XX.XX
S04	XX.XX	XX.XX	XX.XX	XX.XX	XX.XX	XX.XX

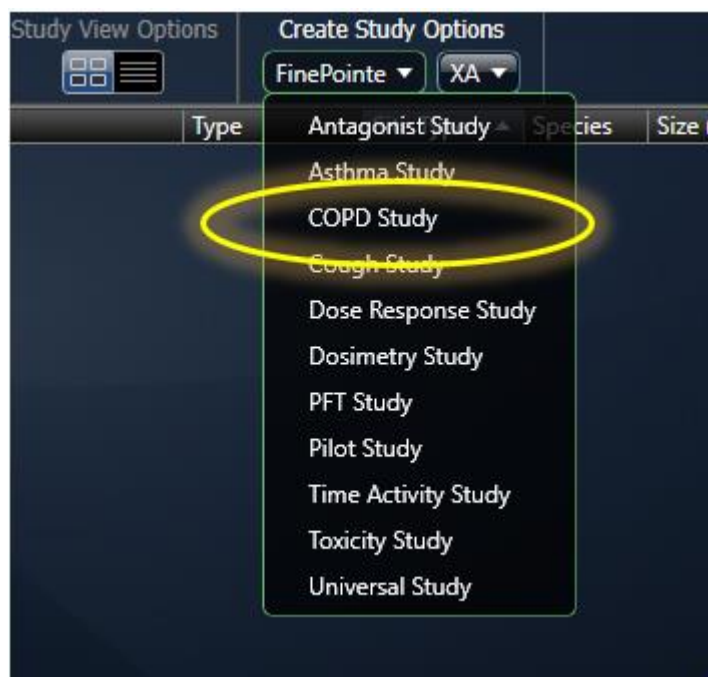
**Week0, Week2, Week4, Week6, Week8, and Week10** are both measurements and phases.

Each phase acquires data in the same way. Figure 28 illustrates the data collection.



**Figure 28.** This illustrates the data acquisition procedure for each phase in a COPD study.

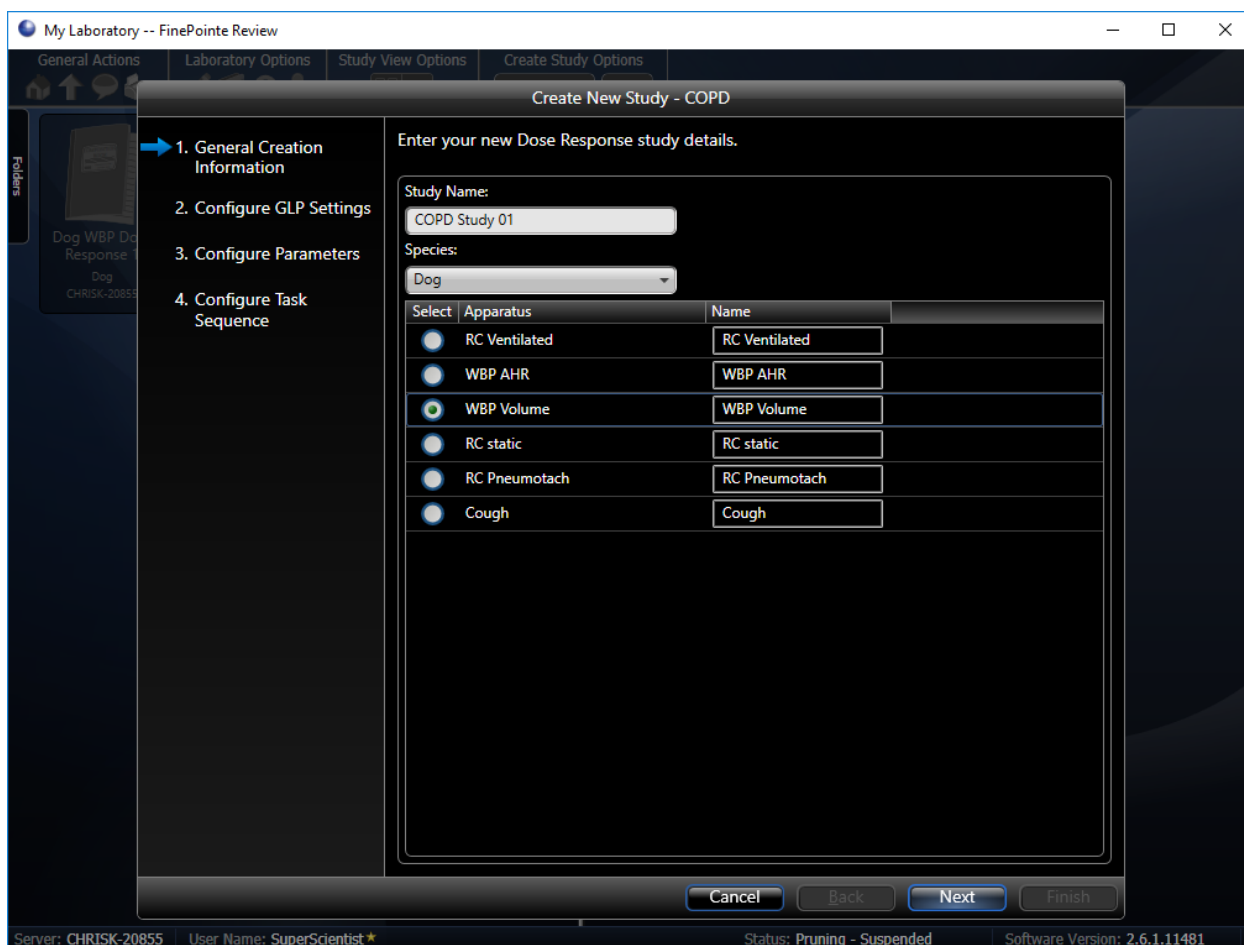
To create the COPD study, begin on the Laboratory page and select **COPD Study** under the **Create Study Options**.



**Figure 29.** Select COPD Study by pulling down the FinePointe menu under Create Study Options.

This launches the *Create COPD Study* wizard.





**Figure 30. The first page of the Create COPD Study wizard.**

## STEP 1- GENERAL CREATION INFORMATION

In the first wizard page, you need to:

1. Type in a Study Name. For this example, we use "COPD Study 01".
2. Choose a species from the drop-down list. Here we chose "Dog".
3. Click to select the appropriate set of apparatus, or acquisition hardware. Choose "WBP Volume". You are free to give another name to the apparatus if you like.
4. Click **Next**.

## STEP 2 - CONFIGURE GLP SETTINGS

Create New Study - COPD

✓ 1. General Creation Information

➔ 2. Configure GLP Settings

3. Configure Parameters

4. Configure Task Sequence

Choose whether this study follows GLP and fill the appropriate details.

☒ This study does not follow GLP

Objective:

Description:

☐ This study follows GLP

Cancel Back Next Finish

**Figure 31.** The second page of the Create COPD study wizard.

This step is optional. If GLP options are enabled, this page permits the user to additional detail that may be required under a GLP environment. Click **Next** to continue to step 3. Please see ***FinePointe GLP Features User Guide*** for additional details.

Click **Next**.

### STEP 3 – CONFIGURE PARAMETERS

The table below lists doses and parameters that are included in this report. To add a new dose, enter a name in the "new dose name" text field in the last row. Each dose name must be unique. If the report type is PC200 Dose Response, dose values must be in ascending order. A parameter must be created to proceed. To add the parameter, click the "New Parameter" button.

Delete	Phase	Dose	f	New Parameter
	Baseline	0	Avg	
	WK0	0	Avg	
	WK2	0	Avg	
	WK4	0	Avg	
	WK6	0	Avg	
	WK8	0	Avg	
	WK10	0	Avg	
	new dose name			

**Figure 32.** The third page of the Create COPD Study wizard. Here you specify the measurements you will take on each subject.

On the third page of the wizard, you specify the list of measurements you will take on each subject. In the list above, each row is a measurement. Here, you also specify one parameter to be summarized in the initial report.

1. Define your desired Phases.

The Phase column allows you to specify the name of the phase and the associated measurement (each get the same name). You can edit this name in place and give it any name that is meaningful to you. To add a new measurement, type the name into the edit box circled in the figure above. To delete a measurement, click the red x.

If you complete this wizard and acquire data, it is still possible to add measurements. It is also possible to rename these measurements. But keep in mind, that if you rename a measurement which has already

been placed in a recording, those placed measurements will also be renamed. So, if you intend to add a measurement, make sure you create a new one and do not simply try to rename and repurpose an existing one.

2. Specify the associated Measurement Dose per Phase.  
The Dose column allows you to specify an optional dose value to associate with each measurement.
3. Specify a parameter which is used to create the first report by clicking the New Parameter button. Choose the parameter of interest and click **OK**. Click on the heading to edit the expression. This report allows for one expression to be summarized in the report.
4. Click **Next**.

## STEP 4 – CONFIGURE TASK SEQUENCE

Create New Study - COPD

✓ 1. General Creation Information

✓ 2. Configure GLP Settings

✓ 3. Configure Parameters

➔ 4. Configure Task Sequence

You may also make adjustments to the following task sequence options.

**Duration of Acclimation period:**  
Specify the duration to stabilize prior to starting the experiment.  
00:20:00

**Response Time:**  
Enter the period of time summarized for each measurement (hh:mm:ss).  
00:20:00

Cancel Back Next Finish

**Figure 33.** The final page of the create COPD wizard.

In the final page of the Create Asthma Study wizard, you can set the criteria which dictate how the data is collected.

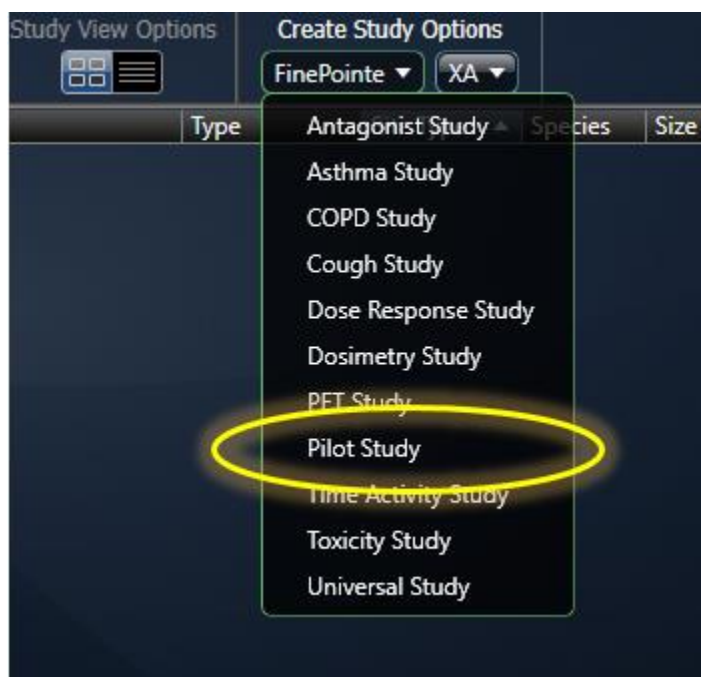
1. Specify a duration for the Acclimation Period, as shown in Figure 33.  
The acclimation period is a period of time that the subject is being recorded in the chamber, and that data will not be used for reporting. This period can be set to any specified duration but can be interrupted by the operator during acquisition, if needed. In this example, 20 minutes is defined.
2. Define the Response Time, or the duration of the measurement placed at the end of the recording. In this case, 20 minutes is defined.
3. Click **Finish**.

---

## CREATE A PILOT STUDY

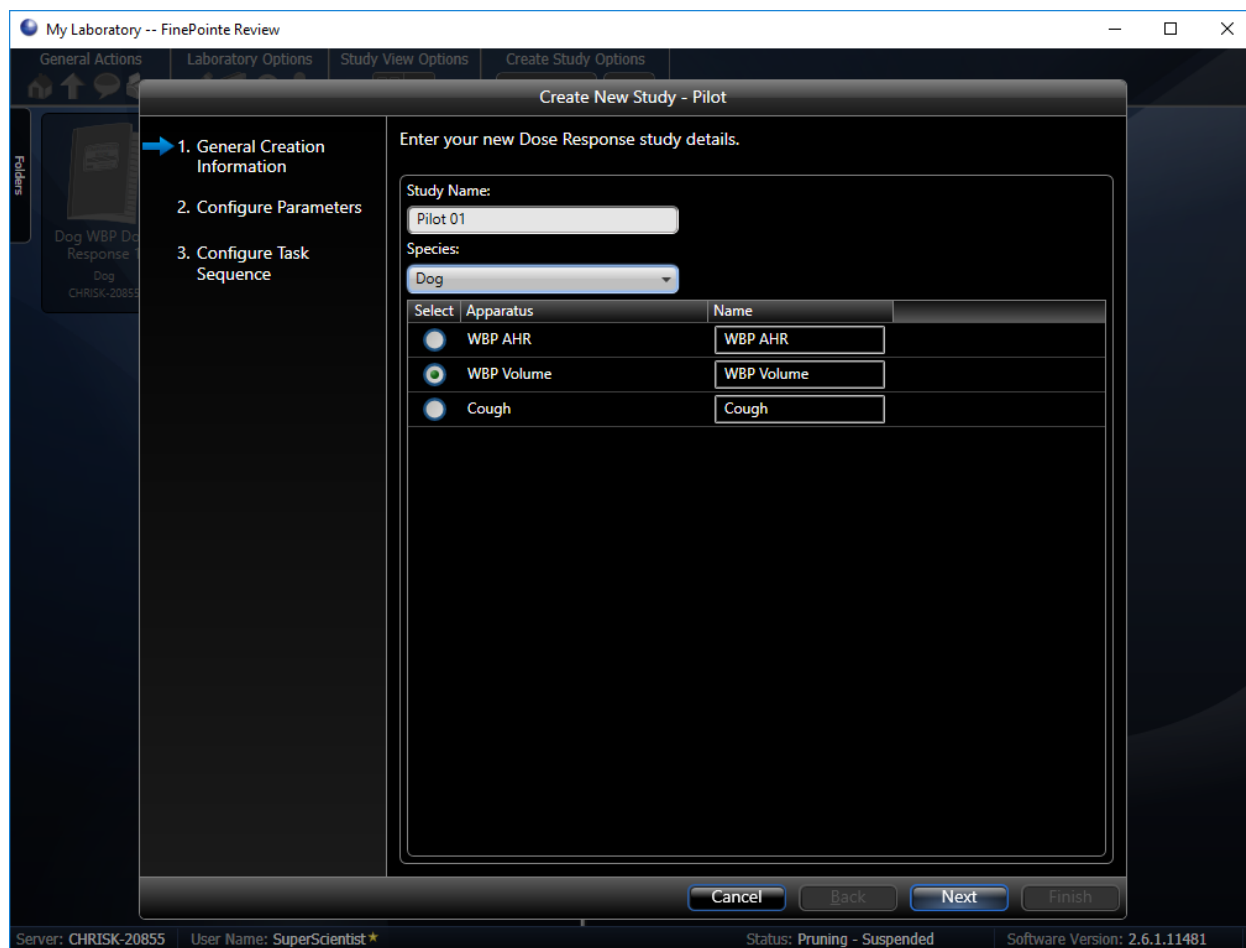
Data collection for a Pilot study provides minimal automated assistance from FinePointe. The data collection protocol waits until you are ready, and then it begins recording. Once recording, each time you press the play button, FinePointe will deliver the aerosol according to the delivery settings you have configured. No measurements are placed. You can create measurements and place them as you wish for your reports.

To create the Pilot study, being on the Laboratory page and select **Pilot Study** under the **Create Study Options**.



**Figure 34.** Select Pilot Study by pulling down the FinePointe menu under Create Study Options.

This launches the Create Pilot Study wizard.



**Figure 35.** The first page of the Create Pilot study wizard.

In the first wizard page, you need to:

1. Type in a Study Name. For this example, we use “Pilot 01”.
2. Choose a species from the drop-down list. Here we chose “Dog”.
3. Click to select the appropriate set of apparatus, or acquisition hardware. Here we chose “WBP Volume”. You are free to give another name to the apparatus if you like.
4. Click **Next**.

## STEP 2 – CONFIGURE GLP SETTINGS

The screenshot shows a software window titled "Create New Study - Pilot". On the left is a vertical sidebar with four steps: "1. General Creation Information" (checked), "2. Configure GLP Settings" (highlighted with a blue arrow), "3. Configure Parameters", and "4. Configure Task Sequence". The main area of the window has a header "Choose whether this study follows GLP and fill the appropriate details." Below this are two radio button options. The first option, "This study does not follow GLP", is selected. It is followed by two text input fields: "Objective:" with a placeholder "enter study objective (optional)" and "Description:" with a placeholder "enter study description (optional)". The second option, "This study follows GLP", is unselected. At the bottom of the window are four buttons: "Cancel", "Back", "Next", and "Finish".

**Figure 36.** The second page of the Create Pilot study wizard.

This step is optional. If GLP options are enabled, this page permits the user to additional detail that may be required under a GLP environment. Click **Next** to continue to step 3. Please see ***FinePointe GLP Features User Guide*** for additional details.

Click **Next**.

## STEP 3 – CONFIGURE PARAMETERS

Create New Study - Pilot

✓ 1. General Creation Information  
✓ 2. Configure GLP Settings  
➔ 3. Configure Parameters  
4. Configure Task Sequence

The table below lists doses and parameters that are included in this report. To add a new dose, enter a name in the "new dose name" text field in the last row. Each dose name must be unique. If the report type is PC200 Dose Response, dose values must be in ascending order. A parameter must be created to proceed. To add the parameter, click the "New Parameter" button.

Delete	Measurement	Dose	TVb	
	Measurement 0	0	Avg	
	Measurement 1	0	Avg	
	Measurement 2	0	Avg	
	Measurement 3	0	Avg	
	new dose name			

New Parameter

Cancel Back Next Finish

**Figure 37.** The third page of the Create Pilot Study wizard. Create your initial set of measurements.

On the third page, you define the initial measurements you want for your report. These values can be changed later. Here, you also specify one parameter to be summarized in the initial report.

Click **Next**.



## STEP 4 – CONFIGURE TASK SEQUENCE

Create New Study - Pilot

✓ 1. General Creation Information

✓ 2. Configure GLP Settings

✓ 3. Configure Parameters

➔ 4. Configure Task Sequence

You may also make adjustments to the following task sequence options.

**Nebulization Time:**  
Enter the nebulization duration (hh:mm:ss).  
00:02:00

**Aerosol Volume:**  
Enter the amount of aerosol to nebulize, in mL.  
0.020

Cancel Back Next Finish

**Figure 38.** The final page of the Create Pilot Study wizard.

In the final page of the Create Pilot study wizard, you can set values for the nebulizer used during data collection.

**Note:** Nebulizer heads lose their efficiency over time. We recommend entering an Aerosol Volume value that is actually double of what you intend to deliver. This will ensure the intended dose is delivered in full within the specified Delivery Duration. Please see **Nebulizer Head Efficiency** section for more information.

Example: if you intend to deliver 0.010mL (10µL) to the test subject, enter 0.020mL (20µL) in the aerosol volume section of the task sequence.

Click **Finish**.

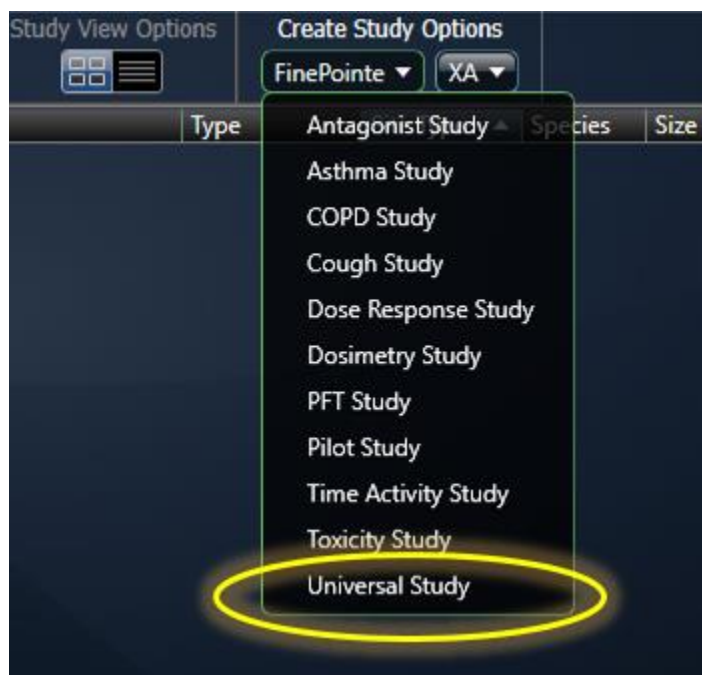
---

## CREATE A UNIVERSAL STUDY

There are many similarities between the Universal Study wizard and the other wizards for the other study types. The Universal study type provides greater control over the data collection procedure and allows you to mix data from Dose Response, Toxicity and other study types. If you find one of the other study types serves your needs, you may want to stick with them, as fewer options generally leads to fewer mistakes.

Once you've created the universal study, FinePointe operates essentially the same way as it does with the other study types.

To create a Universal Study, begin on the Laboratory page and select **Universal Study** under the **Create Study Options**.



**Figure 39** Select Universal Study by pulling down the FinePointe menu under Create Study Options.

This launches the *Create Universal Study* wizard.

## STEP 1 – GENERAL CREATION INFORMATION

My Laboratory -- FinePointe Review

General Actions Laboratory Options Study View Options Create Study Options

1. General Creation Information

2. Measurements and Phases

3. Configure Task Sequence

Create New Study - Universal Study

Select your new Universal Study details.

Study Name: WBP Univ Study 01

Species: Dog

Select	Apparatus	Name
<input checked="" type="radio"/>	WBP AHR	WBP AHR
<input checked="" type="radio"/>	WBP Volume	WBP Volume
<input checked="" type="radio"/>	Cough	Cough

Cancel Back Next Finish

Server: CHRISK-20855 User Name: SuperScientist Status: Pruning - Suspended Software Version: 2.6.1.11481

**Figure 40. The first page of the Create Universal Study wizard.**

In the first wizard page, you need to:

1. Type in a Study Name. For this example, we use “WBP Univ Study 01”.
2. Choose a species from the drop-down list. Here we chose “Dog”.
3. Click to select the appropriate set of apparatus, or acquisition hardware. Here we chose “WBP Volume”. You are free to give another name to the apparatus if you like.
4. Click **Next**.

## STEP 2 – CONFIGURE GLP SETTINGS

Create New Study - Universal Study

✓ 1. General Creation Information

➔ 2. Configure GLP Settings

3. Measurements and Phases

4. Configure Task Sequence

Choose whether this study follows GLP and fill the appropriate details.

☒ This study does not follow GLP

Objective:

Description:

☐ This study follows GLP

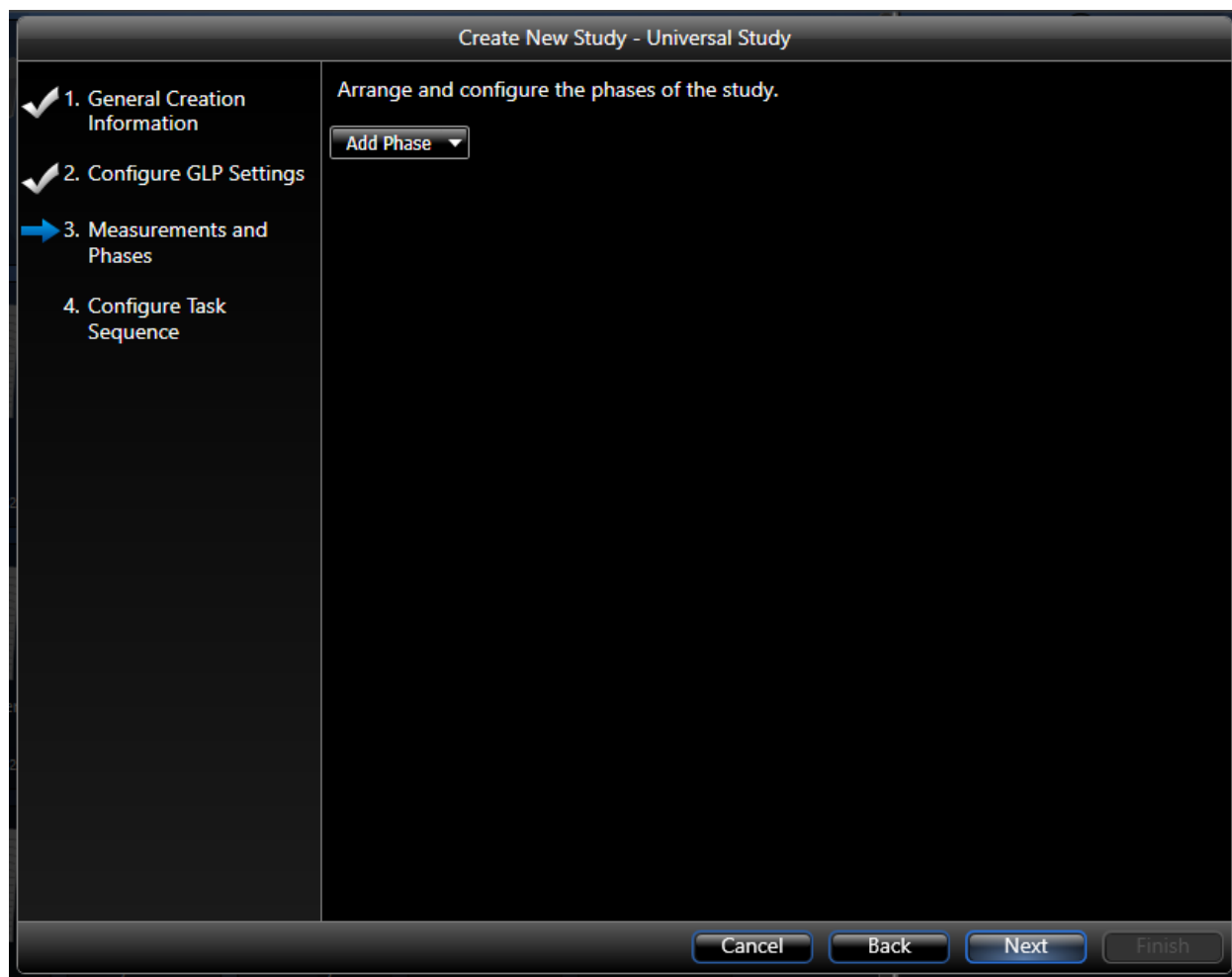
Cancel Back Next Finish

**Figure 41.** The second page of the Create Universal Study wizard.

This step is optional. If GLP options are enabled, this page permits the user to additional detail that may be required under a GLP environment. Click **Next** to continue to step 3. Please see ***FinePointe GLP Features User Guide*** for additional details.

Click **Next**.

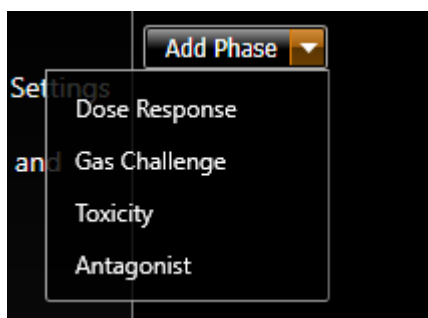
## STEP 3 – MEASUREMENTS AND PHASES



**Figure 42.** The third page of the Create Universal Study wizard.

The third wizard page allows you to setup the data collection you will perform. The page begins blank except for a single pulldown button which allows you to add a phase. A phase is data collection session which describes data you will acquire on more or more subjects.

When you pull down **Add Phase**, you are presented with the following options:



**Figure 43.** The various phase types you can add to the study.

You can create as many phases as you need. Each phase type suggests a specific data collection task sequence. When you define a phase, you define the specific measurements which will be taken in that phase and the data collection settings used to acquire them.

*Note:* The Gas Challenge phase is not support for LA WBP applications with the QT Digital Preamplifier.

After you have added and configured the phases of the study, click **Next**.

The next section, **Universal Study Phases**, will detail each of the phase types and how to configure them.

## STEP 4 – CONFIGURE TASK SEQUENCE

The screenshot shows a software window titled "Create New Study - Universal Study". On the left is a vertical sidebar with four steps: "1. General Creation Information", "2. Configure GLP Settings", "3. Measurements and Phases", and "4. Configure Task Sequence". Steps 1, 2, and 3 are marked with checkmarks, while step 4 is marked with a blue arrow. The main area of the window contains the heading "You may make adjustments to the following task sequence options." Below this, there are two sections. The first is "Duration of Acclimation period:" with a subtext "Specify the duration for subject acclimate to the apparatus. This period is recorded. (hh:mm:ss)." and a text input field containing "00:05:00". The second is "Starting Gas or Bias Flow selection:" with a subtext "Specify the Bias Flow mode or gas to be selected before and after the experiment." and a dropdown menu currently showing "Pull Bias Flow". At the bottom of the window are four buttons: "Cancel", "Back", "Next", and "Finish".

**Figure 44.** The last page of the Create Universal Study Wizard. This page lets you configure common task sequence settings.

At the beginning of each data collection, data is acquired while the subject acclimates to the data collection environment. This data is not used in the reporting, but does give the investigator additional context which can be used qualitatively to evaluate the subject and the data. The operator can choose to terminate the acclimation period at his discretion.

The **Duration of the Acclimation Period** is maximum duration of the acclimation.

The **Starting Gas or Bias Flow Selection** specifies what to deliver to the subject prior to starting the experiment and after the data collection is complete.

Once you are satisfied with these settings, click **Next**. The study is created and opened.

## UNIVERSAL STUDY PHASES

This section details each of the phase types available in the Universal Study Type.

### DOSE RESPONSE PHASE

A Dose Response phase allows you to collect data like the Dose Response study does. This allows you to deliver a series of doses of a compound and measure the response to each delivery. Unlike the Dose Response study, you have the option to specify how each response is measured independently.

When you select **Add Phase | Dose Response**, you are presented with a form that allows FinePointe to quickly set up your initial doses:

The screenshot shows the 'Create New Study - Universal Study' dialog box. On the left, a sidebar lists four steps: 1. General Creation Information, 2. Configure GLP Settings, 3. Measurements and Phases (highlighted with a blue arrow), and 4. Configure Task Sequence. The main area of the dialog is titled 'Arrange and configure the phases of the study.' and contains an 'Add Phase' button. A secondary dialog box, titled 'Dose Response Phase', is open in the foreground. It prompts the user to 'Select the dose list type and other details related to that type.' and offers three radio button options: 'Simple Dose List' (with the subtext 'Prefixed dose list.'), 'Geometric Dose List' (with the subtext 'Dose list such as PBS, 1mg/ml, 2mg/ml, 4mg/ml, etc.'), and 'Semi-Logarithmic Dose List' (with the subtext 'Dose list such as PBS, 1mg/ml, 3mg/ml, 10mg/ml, 30mg/ml, etc.'). The 'Geometric Dose List' option is selected. Below these options is a section titled 'Geometric Dose List Details' which contains two input fields: 'Highest Dose:' with a value of '50' and a unit dropdown set to 'mg/ml', and 'Number of Doses:' with a value of '6'. At the bottom of the 'Dose Response Phase' dialog are 'OK' and 'Cancel' buttons. At the bottom of the main 'Create New Study' dialog are 'Cancel', 'Back', 'Next', and 'Finish' buttons.

**Figure 45.** The Add Dose Response Phase form prompting you so that FinePointe can setup your initial doses.

The form presented is very similar to the third page of the Dose Response Study. Select either Simple Dose List, Geometric Dose List, or Semi-Logarithmic Dose List depending on which selection most closely matches the



pattern of your dose sequence. If there is no real pattern, then the first option is probably best. The selections you make here are so that FinePointe can provide a good starting dose list, but you will have an opportunity to edit it later.

Click **OK** when done.

**Create New Study - Universal Study**

1. General Creation Information  
2. Configure GLP Settings  
3. Measurements and Phases  
4. Configure Task Sequence

Arrange and configure the phases of the study.

**Add Phase**

**Dose Response**

☒ Use Common Measurement Details

Measurement Duration: 00:03:00    Type of Challenge: Aerosol Before Measurement

Recovery Duration: 00:01:00    Aerosol Volume (mL): 0.01    Nebulization Duration: 00:00:30

Measurements included in this phase:

	ID	Dose
1	PBS	0
2	3.125 mg/m	3.125
3	6.25 mg/ml	6.25
4	12.5 mg/ml	12.5
5	25 mg/ml	25
6	50 mg/ml	50

Cancel    Back    Next    Finish

**Figure 46. Dose Response phase added.**

After you click OK, FinePointe creates a Dose Response phase and adds it to the list of phases below the **Add Phase** button. Figure 46 shows an example Dose Response phase. The name of the phase is defaulted to “Dose Response”. If you have more than one phase, you should change this to a name that is meaningful within the study. When you acquire data, this is how you will select this phase to acquire data for.

You can edit the ID or dose of each measurement by changing the values in place. Also, you can delete measurements by clicking the beside the measurement. The Green button will add a new measurement to the end of the list.

If each dose should be administered and measured in the same way, then you want **Use Common Measurement Details** to be checked. Then you can set a single **Measurement Duration**, **Type of Challenge**, **Recovery Duration**, **Aerosol Volume** and **Nebulization Duration**. If you want to set these values separately for each dose, then you should uncheck this option.

The **Measurement Duration** is the width of the measurement placed following the challenge.

**Type of Challenge** describes how the challenge is administered and monitored. You can choose one of the following options:

**Figure 47.** This shows the options available for the **Type of Challenge** selection.

<b>Manual</b>	FinePointe does nothing except wait for you to deliver the dose, and it continues when you press the ► button during data collection.
<b>Aerosol Before Measurement</b>	The aerosol is delivered by FinePointe, and FinePointe places a measurement starting after the aerosol has been completely delivered. This option is typically used for WBP aerosol delivery.
<b>Aerosol During Measurement</b>	The aerosol is delivered by FinePointe, and FinePointe places a measurement starting when the aerosol delivery begins.

The **Aerosol Volume** is the volume of liquid material that will be nebulized, assuming the aerosol head is accurately calibrated. Since the calibration of the aerosol head changes as it is used, and it is likely you will not calibrate it each time, you should specify a value here which is greater than you expect to deliver (perhaps as much as two times the amount to be delivered). By specifying a larger value, you will be sure to nebulize the entire volume. The volume of the dose will be the best way to ensure consistency of aerosol delivery. A value of 0.020mL (20µL) is a good value to set here, and you should fill the nebulizer head with 0.010mL (10µL) each time you deliver the dose. Use the same volume for each dose and vary the liquid concentration of the solution to deliver increasing concentrations.

The **Nebulization Duration** specifies how long FinePointe will take to deliver the Aerosol Volume you specify. For WBP, you should set this to 1 or 2 minutes.

The **Recovery Duration** is the amount of time the subject is given to return to normal between doses. For Mch, it is common to have the duration from the start of one dose to the start of the next dose to be at least 7 minutes.

To achieve this, the sum of the Measurement Duration, Nebulization Duration, and the Recovery Duration should exceed 7 minutes.

The screenshot shows the 'Create New Study - Universal Study' window. On the left, a sidebar lists four steps: 1. General Creation Information, 2. Configure GLP Settings, 3. Measurements and Phases (highlighted with a blue arrow), and 4. Configure Task Sequence. The main area is titled 'Arrange and configure the phases of the study.' and contains an 'Add Phase' button. Below this, a 'Dose Response' phase is selected, and the 'Use Common Measurement Details' checkbox is unchecked. A table titled 'Measurements included in this phase:' shows three entries:

ID	Dose	Measurement Duration	Recovery Duration	Type of Challenge	Aerosol Volume (mL)	Nebulization Duration
1	PBS 0	00:03:00	00:01:00	Aerosol Before Measurement	0.01	00:00:30
2	3.125 mg/m 3.125	00:03:00	00:01:00	Aerosol Before Measurement	0.01	00:00:30
3	6.25 mg/ml 6.25	00:03:00	00:01:00	Aerosol Before Measurement	0.01	00:00:30

At the bottom of the window are buttons for 'Cancel', 'Back', 'Next', and 'Finish'.

**Figure 48.** The same Dose Response phase, but Use Common Measurement Details is unchecked. You have to ability to set up each dose's response details independently.

## GAS CHALLENGE PHASE

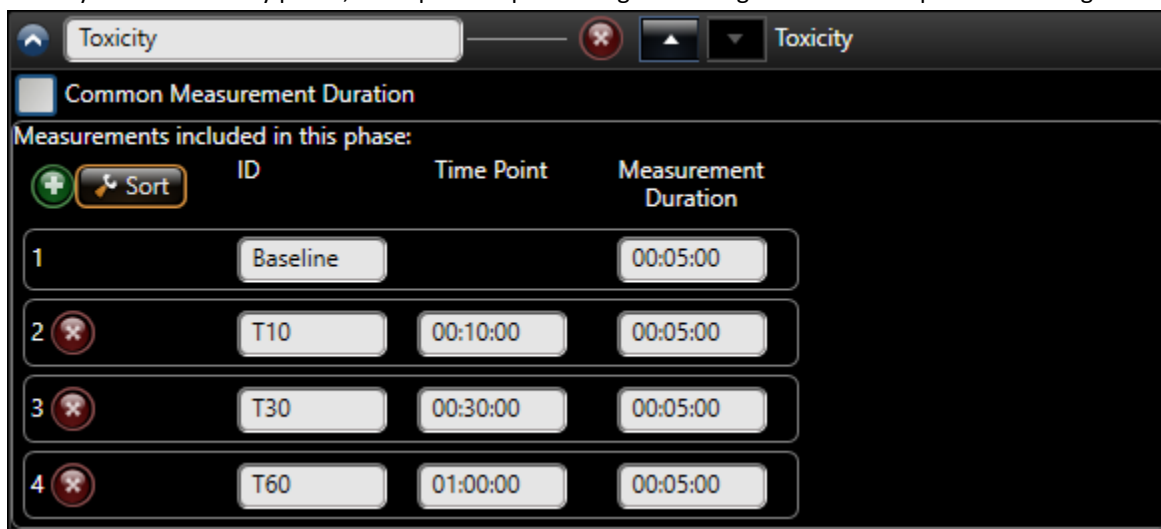
The Gas Challenge phase delivers gases to each WBP chamber according to a user defined sequence. It is only compatible with the 2/4-site FinePointe WBP Controller. Since Large Animal WBP requires the use of the QT instead for the FinePointe WBP Controller, this Phase will not be described.

To learn more about the Gas Challenge Phase for Small Animal WBP, please see the [FinePointe WBP Application Manual](#).

## TOXICITY PHASE

The Toxicity phase monitors the WBP data for a baseline measurement, waits for you to deliver a compound, then takes a series of time point measurements following the delivery of the compound.

When you add a Toxicity phase, a template sequence of gas challenges is created as presented in Figure 49.



	ID	Time Point	Measurement Duration
1	Baseline		00:05:00
2	T10	00:10:00	00:05:00
3	T30	00:30:00	00:05:00
4	T60	01:00:00	00:05:00

**Figure 49. The template Toxicity phase added.**

By default, the new phase is named “Toxicity”. You should change this name to something more meaningful if you have more than one phase in the study.

Each row represents a time point. The first row cannot be deleted. This row is the baseline row.

The **ID** column is the measurement ID used to identify the measurement in your reports.

The **Time Point** column determines when the measurement is taken. This defines the end of the measurement. If you specify them out of order, they will be resorted automatically when you leave this form. You can force FinePointe to sort them immediately by clicking the **Sort** button.

The **Measurement Duration** defines the width of the measurement. If you specify a duration that forces the measurement to overlap the previous measurement, then the duration is truncated so that it will not overlap the previous measurement.

If you check the **Common Measurement Duration**, then the measurement duration of the baseline measurement and the first time point measurement can be set. Subsequent time points will use the same measurement duration as the first time point.

Delete a time point by clicking the red **Delete** button:



Add a new time point by clicking the green **Add** button:



## ANTAGONIST PHASE

An Antagonist phase is not commonly used but is described here for completeness. In an antagonist phase, the following data collection procedure is performed:

1. Challenge the subject at a regular interval with an agonist (for example one challenge every 10 minutes).
2. Accept the first 3 or 4 challenges as a baseline
3. Deliver an antagonist compound (manually)
4. Continue challenging the subject to create a time course of the agonist challenges following the antagonist.

When you add an antagonist phase, use the following form to configure it.

The screenshot shows a software window titled "Create New Study - Universal Study". On the left is a sidebar with four steps: "1. General Creation Information", "2. Configure GLP Settings", "3. Measurements and Phases" (highlighted with a blue arrow), and "4. Configure Task Sequence". The main area is titled "Arrange and configure the phases of the study." and contains an "Add Phase" button. Below this, a phase named "Antagonist" is selected, shown in a dropdown menu. The main configuration area is titled "Adjust any of the following Antagonist Study options." and contains several input fields: "Agonist Period:" (00:10:00 HH:MM:SS), "Aerosol Volume:" (0 ml), "Duration of Baseline:" (00:00:30 HH:MM:SS), "Duration of Aerosol:" (00:00:00 HH:MM:SS, must be less than Duration of Measurement), "Duration of Measurement:" (00:03:00 HH:MM:SS), "Duration of Recovery:" (00:00:00 HH:MM:SS), and "Maximum Challenges:" (40). There is also a checkbox labeled "Administer Challenges Manually" which is currently unchecked. At the bottom of the window are four buttons: "Cancel", "Back", "Next", and "Finish".

**Figure 50.** This is presented to configure an Antagonist Phase.

The **Agonist Period** defines how often the agonist is delivered to the subject.

The **Aerosol Volume** is the volume of the agonist delivered with each challenge. Specify two times the volume intend to deliver.

The **Duration of Baseline** is the baseline duration of an individual challenge. This is not the same as the baseline challenges which are delivered before the agonist is delivered. Each challenge has a separate baseline used to quantify the magnitude of the challenge.

**Duration of the Measurement** is the duration of the measurement of each individual challenge.

**Duration of Recovery** is the duration that the subject is given to recover from each challenge.

**Maximum Challenges** is the maximum number of challenges acquired within the phase.

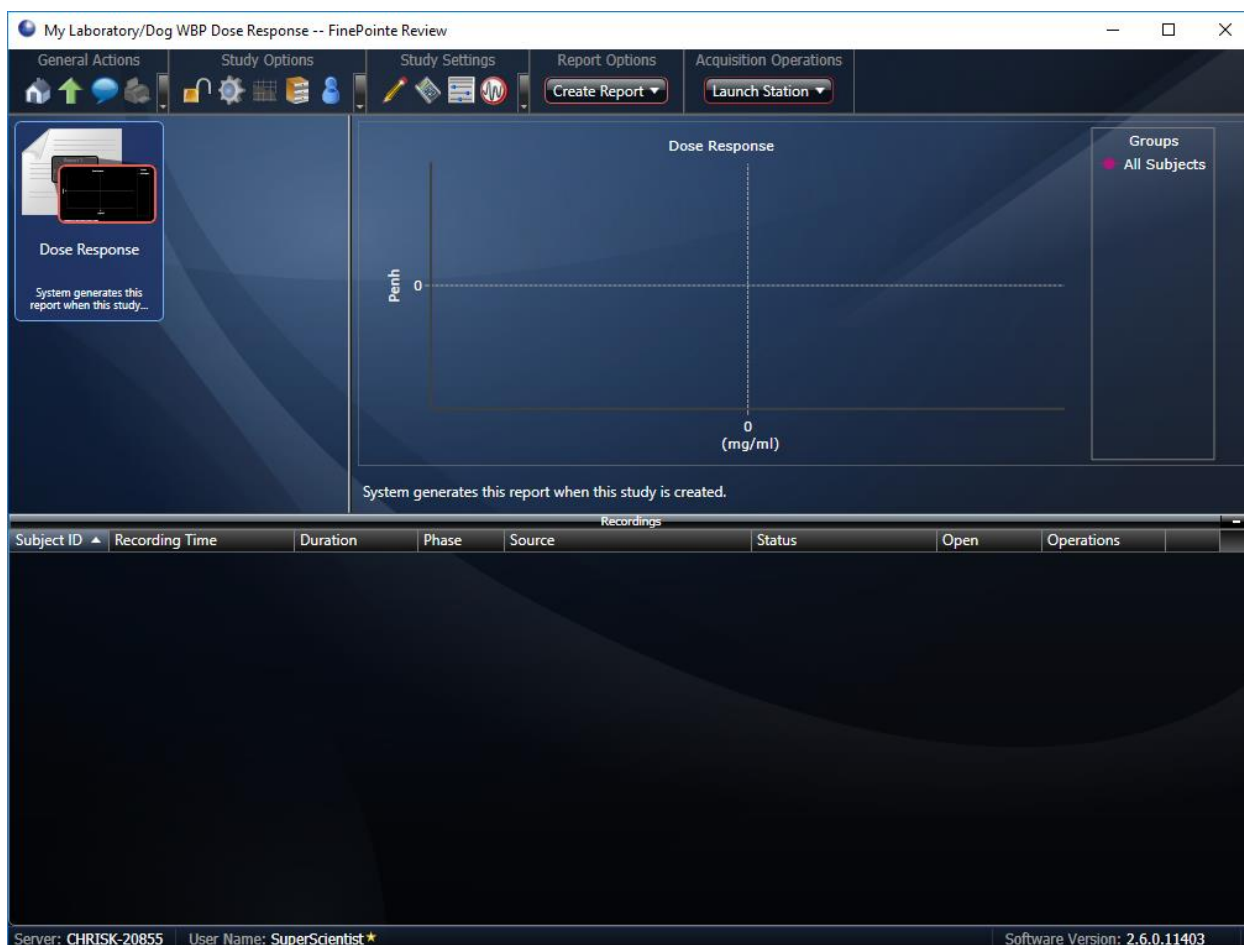
## SUBJECT AND GROUP CREATION

FinePointe provides a powerful reporting engine which allows you to obtain group summary reports. In addition to saving time and eliminating mistakes, making use of the built-in reporting features provides you with a fully annotated and traceable dataset—traceable back to the original signal data.

One major part of the reporting features is the ability to create subject groups. You can create as many groups as desired, and have as many subjects in each group as you want. Also, subjects can belong to multiple groups, and you can add and remove subjects from groups at any time. If subjects are added or removed from a group, all reports that summarize that group are automatically recomputed.

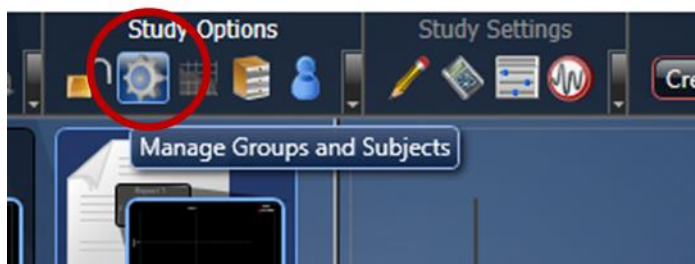
When you define a report, you specify 3 key pieces of information: the groups to include in the report, the parameters (or parameter expressions) to summarize, and the measurements to use to select the data.

Although subjects and groups may be set up at any time, before or after data collection, it tends to be easier to define these upfront. This allows you to select the appropriate subject during acquisition and, once acquisition is stopped, will result in a report being populated.



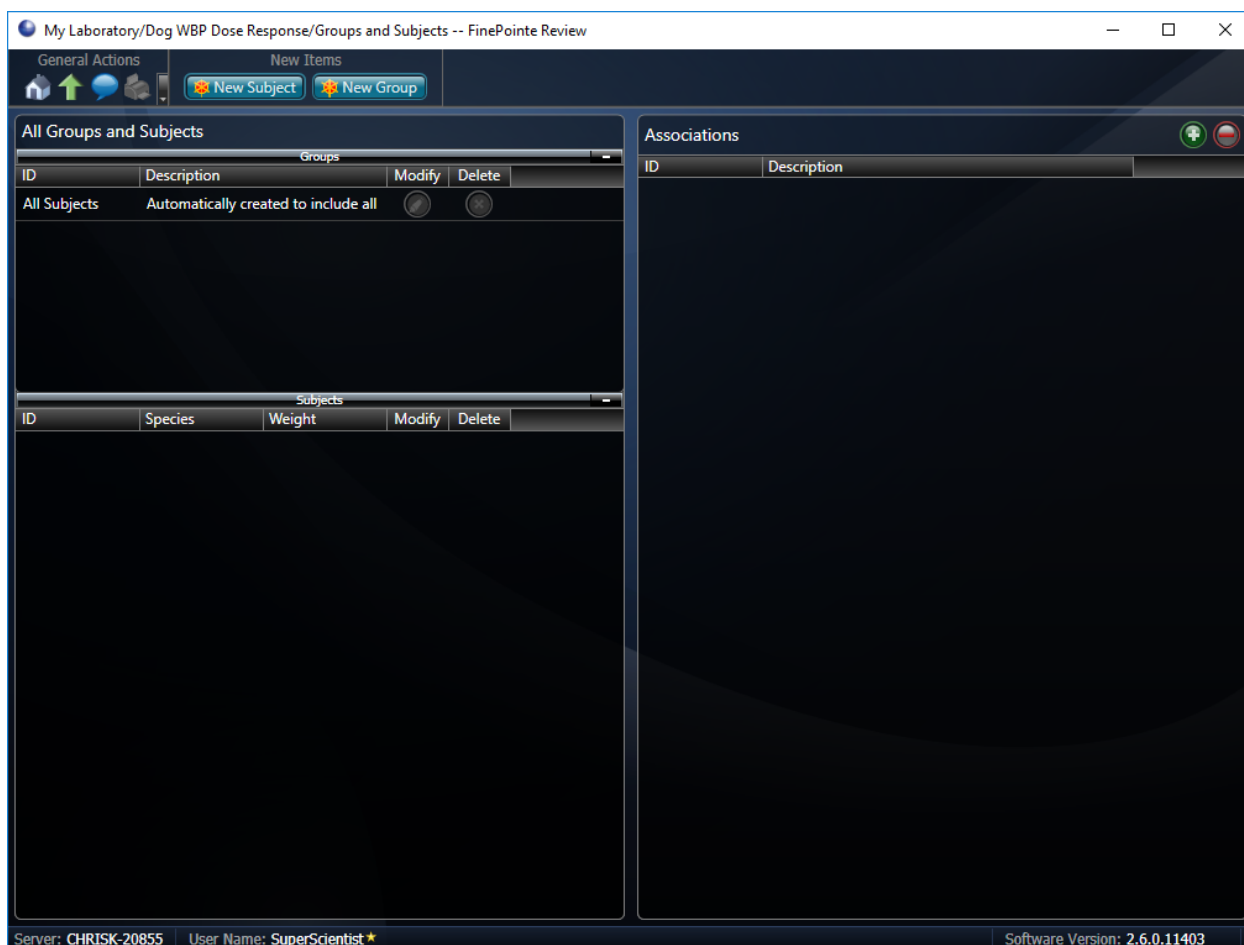
**Figure 51.** This show the main study page as seen immediately after creating a study.

To create or modify subjects and groups, click the **Manage Groups and Subjects** button from the main study page, as shown in Figure 52.



**Figure 52.** This shows the **Manage Groups and Subjects** button on the main study page.

The **Groups and Subjects** page is presented. This page shows you the groups and subjects that are currently defined in your study database.



**Figure 53.** Select the *New Subject* button from the *Manage Groups and Subjects* page.

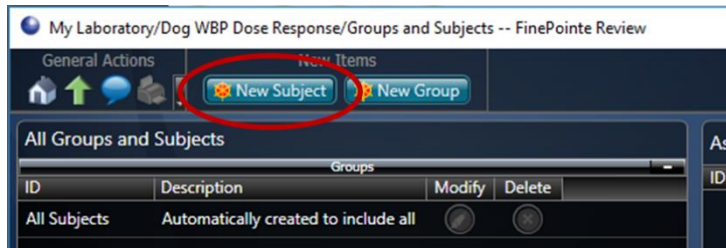


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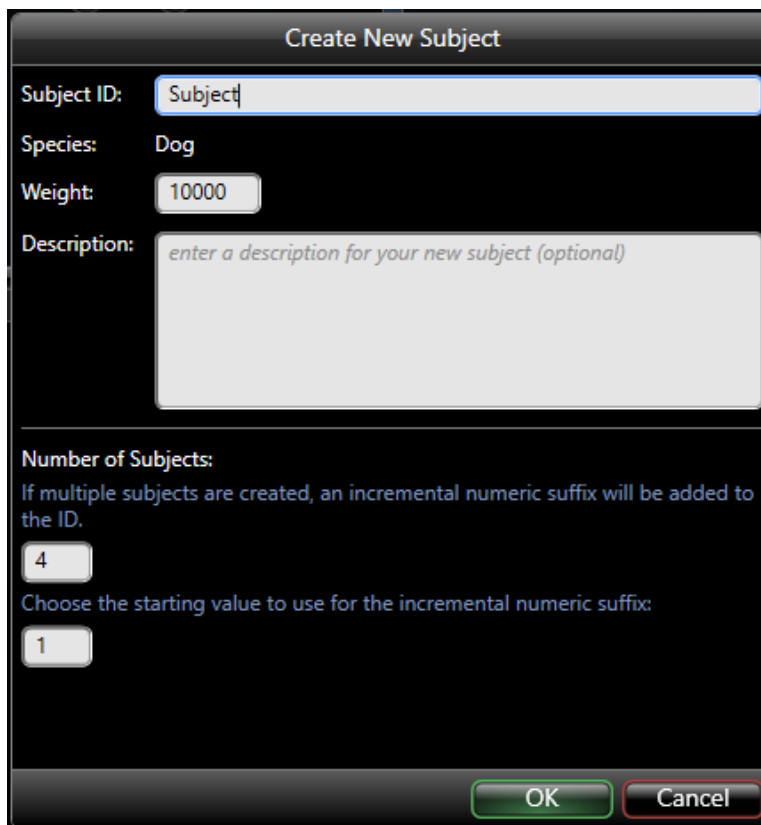
## CREATE SUBJECTS

To create Subjects for your study:

1. Click the **New Subject** button to start adding Subject IDs.



2. The *Create New Subject* form will be presented. Enter a **Subject ID**. Optionally, enter a **Weight** (grams) and **Description** of the new subject.

A screenshot of the 'Create New Subject' form. The form has a title bar that says 'Create New Subject'. Below the title bar, there are four input fields: 'Subject ID:' with the text 'Subject', 'Species:' with the text 'Dog', 'Weight:' with the text '10000', and 'Description:' with a text area containing the placeholder text 'enter a description for your new subject (optional)'. Below these fields, there is a section titled 'Number of Subjects:' with a text box containing the number '4'. Below this, there is a text label 'Choose the starting value to use for the incremental numeric suffix:' with a text box containing the number '1'. At the bottom of the form, there are two buttons: 'OK' and 'Cancel'.

3. To quickly create multiple subjects, enter the number of Subjects desired in the first text box associated with the *Number of Subjects* header. Then, enter the starting value to increment the Subject IDs by in the second text field. In the example above, 4 subjects will be created with the Subject ID prefix "Subject" starting with suffix "1". Alternatively, repeat steps 2 and 3 to create additional Subjects.
4. Click **OK** to create the subject(s).



**Figure 54.** This shows the Groups and Subjects page with 8 subjects configured.

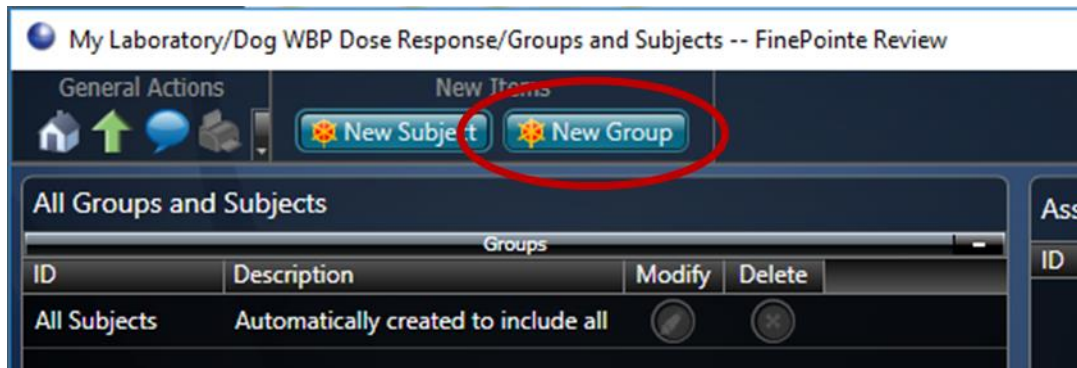
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## CREATE GROUPS

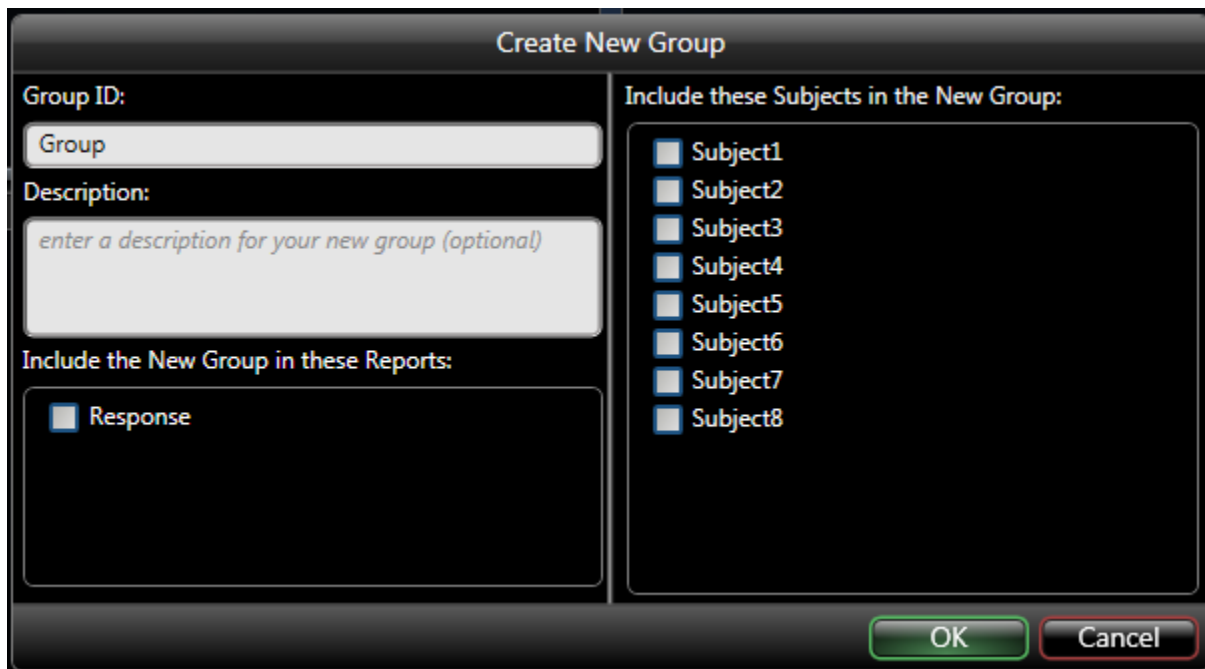
By default, the *All Subjects* group is present, and all subjects added to the study are automatically added to this group.

To create your desired groups:

1. Click the **New Group** button located under *New Items* at the top of the page.



A dialog box like the one shown in Figure 55 is presented.




**Figure 55.** This shows the dialog box presented when you click the **New Group** button.

2. Enter a unique **Group ID**.

The Group ID is a text identifier for this group in the reports. Choose an ID which is meaningful and unique from all the other groups. Description is optional.

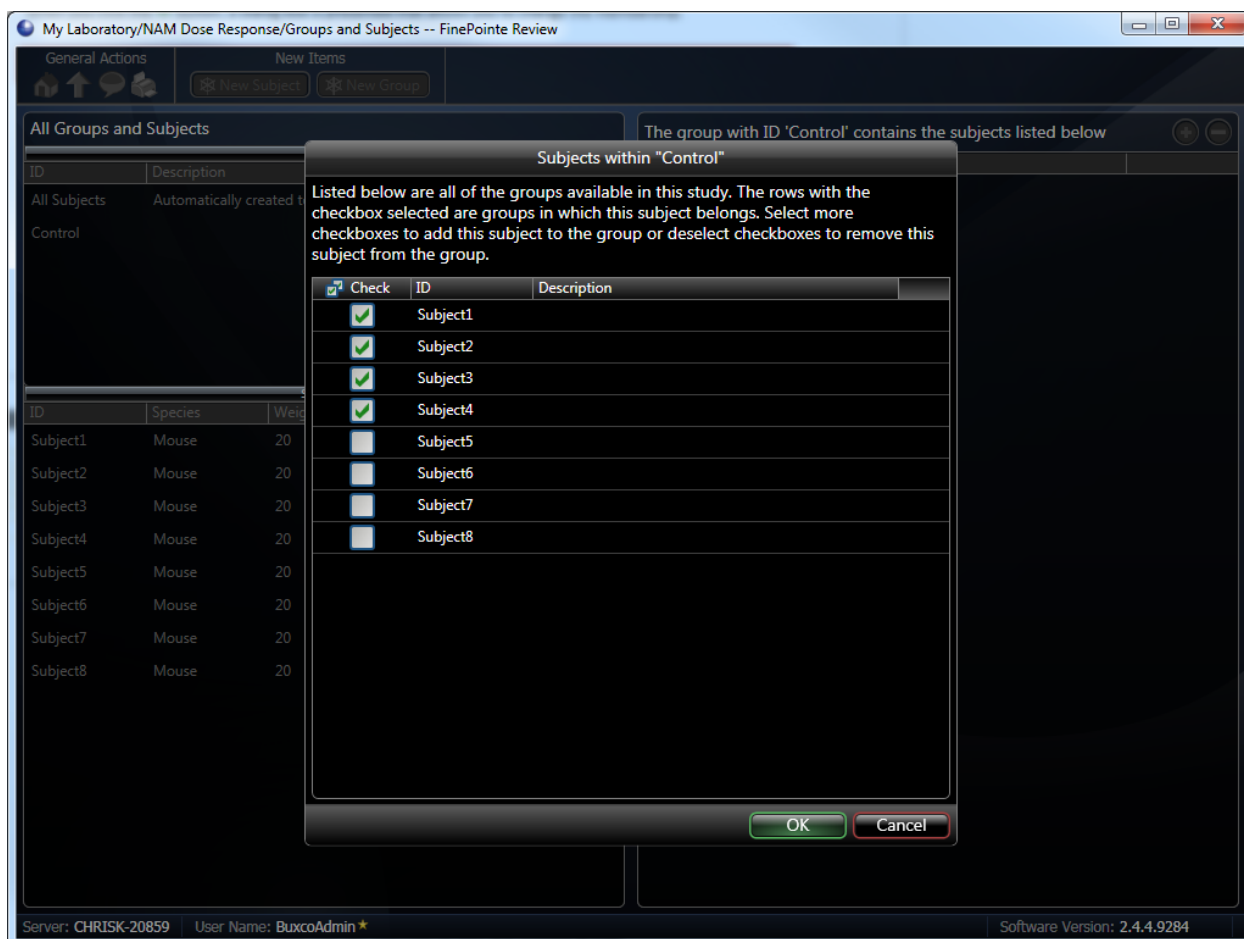
3. Select the Subject(s) to include in this report from the list on the right, by checking the associated checkbox. The list on the right displays all the subjects currently defined in the study.
4. There is also a list of reports located under the description. Checking the checkboxes will add this group to the select reports. This may be changed by editing the report.
5. Click **OK**.

Once a group is defined, you can click on it in the *Groups and Subjects* page and the list on the right half of the page will be populated with the subjects that are members of that group. You can quickly change the membership by selecting the group and clicking the  button above the list on the right.



**Figure 56. Example displaying a “Control” group containing subjects 1-4.**

When you click the  button, a dialog box is presented that allows you to change the membership.



**Figure 57.** This shows the dialog box that allows you to change the subjects which are members of the group. Place a check by each subject which should be part of the group.

Select the subjects and click the **OK** button.

To remove a subject from the group, simply select the subject from the Group Subject List on the right and then select the delete button.



## RUNNING AN EXPERIMENT

One of the greatest benefits of FinePointe software is the integration with reporting. FinePointe is aware of the types of reports you want to produce, so it is able to assist you with data acquisition in a way unmatched by any other system available.

In assisting with your data collection, it helps ensure consistency of the data, freeing your hands up and your mind from details so that you can be more aware of other aspects of the experiment that may also impact consistency. As you acquire data, FinePointe automatically annotates the data so that you have a complete documented record of what took place, and it also places measurements which will be used for your reports.

Once you are done acquiring data for a subject, typically you only need to add that subject to its associated groups (if you have not already done so by creating subjects and groups ahead of time). FinePointe automatically imports the new data in to your study and updates your reports.

In addition to all this automation, FinePointe allows you to annotate your data yourself, or operate totally manually, if you need to for some reason. FinePointe Station is designed to offer automation where it helps and stay out of your way if you do not need it.

## DATA ACQUISITION

To acquire data, you will first calibrate (before you come here), then you will do the following:

- Launch FinePointe Station for the study where you will store the data
- Assign subject IDs to sites
- If running for the first time, you will set up your views.
- Acquire your data using the Task Sequence which walks you through your data collection procedure.
- End the session, which starts the upload to the database.



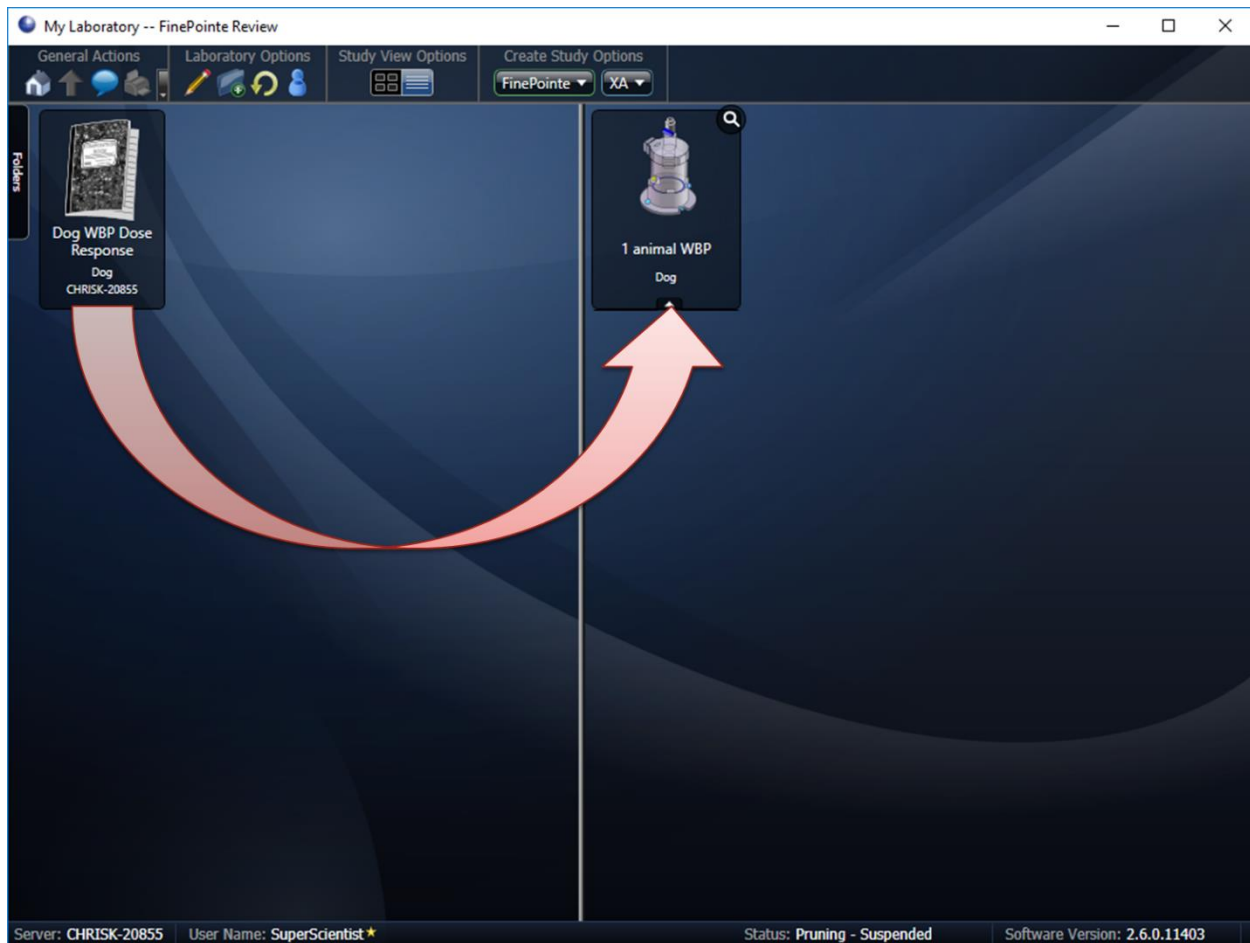
For safety purposes, do not place animals in a plethysmograph prior to starting the bias flow. See [Buxco Bias Flow Manual](#) for more information.

**NOTE:** Do NOT place animals into plethysmographs until you have completed the initial acquisition wizard and are monitoring the signals. See **Animal Safety and Bias Flow** section for more information.

## LAUNCHING FINEPOINTE STATION

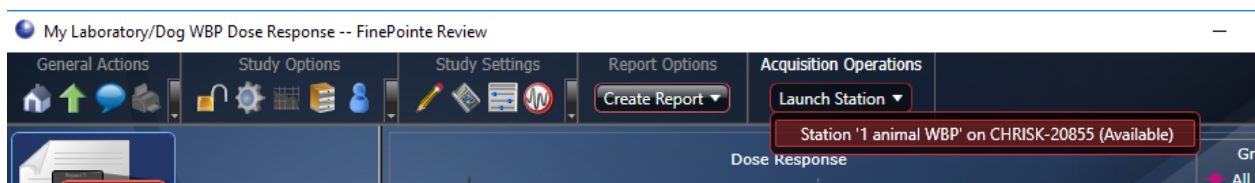
To acquire data, launch FinePointe Station for the study on the hardware configuration you want to run on. There are 2 ways to do this, and they are both functionally equivalent.

To launch FinePointe Station using the “Drag-and-Drop” method, navigate to the laboratory page and drag-and-drop the study on the station from which to acquire.



**Figure 58.** This illustrates how to launch FinePointe Station using the Drag-and-Drop method. Use the mouse to select and drag the study and drop it on the Station configuration.

Alternatively, select the **Launch Station** button on the command bar of the *Study* page. Only station configurations which are compatible with the study are listed.



**Figure 59.** This illustrates where you can find the Launch Station button on the main Study page.

## ASSIGNING SUBJECTS TO SITES

After you launch acquisition, FinePointe Station opens the Assign Subject IDs page. In this page, you identify the subjects that you place in each site of the station configuration. The subject ID can be almost any nonblank text.

Configure Acquisition Session - 1 animal WBP Station

1. Configure Task Sequence  
2. Assign Subjects to Sites  
3. Calibrate Selected Sites

Create new subject assignments by selecting the appropriate subjects below. If the site is currently in use you will be asked to confirm that you want to stop collecting data for the current subject. If you need to add a new subject, enter the new subject ID and click the Add button.

Subject

Subject ID (Dog) Weight 10000 Create Subject Bulk Add Clear Assignments

Site	Subject ID	Weight	Temperature
Dog Site 1	type or drag	0	

Subjects Without Data: Dog1, Dog2, Dog3, Dog4

Subjects With Data:

Cancel Back Next Finish

**Figure 60.** This shows the Assign Subject IDs page for a Large Animal WBP apparatus. The area marked with the box indicates where the subject IDs need to be assigned.

In Figure 60, the box marks the area where you need to assign the subject IDs. The list labeled “Subjects Without Data” are subject IDs that you have already created, but do not yet have recordings associated with them. Items in this list were created in the **Subject and Group Creation** Page described earlier in this manual.

The list labeled “Subjects With Data” are subject IDs that already exist in your study, and there are already recordings in the study associated with them.

You can use the subject IDs in either of these bottom lists by dragging and dropping them on the appropriate site.

Alternatively, you can create new subject IDs by typing them in the **Subject ID** text box above the site list and clicking **Create Subject**.

If you do not have any specific subject designation but want to make sure each subject ID is new and unique, you can type a subject ID root name into the **Subject ID** text box and click **Bulk Add**. This will use the text you specify in the **Subject ID** text box and append a number onto it for each subject it creates.



Add the relevant subject weights for record-keeping purposes or if weight compensation is desired for parameter calculation purposes.

You do not need to assign a subject ID to each site. Only sites with assigned subject IDs are acquired, so you can use this as a way of running with fewer sites.

Configure Acquisition Session - 1 animal WBP Station

1. Configure Task Sequence  
2. Assign Subjects to Sites  
3. Calibrate Selected Sites

Create new subject assignments by selecting the appropriate subjects below. If the site is currently in use you will be asked to confirm that you want to stop collecting data for the current subject. If you need to add a new subject, enter the new subject ID and click the Add button.

Subject

Subject ID (Dog) Weight

10000 10000 Create Subject Bulk Add Clear Assignments

Site	Subject ID	Weight	Temperature
Dog Site 1	Dog1	10000	37.5

Subjects Without Data

Dog2  
Dog3  
Dog4

Subjects With Data

Cancel Back Next Finish

**Figure 61.** This shows the *Assign Subjects to Sites* form with only subject IDs assigned to Site 1 and Site 2. So, if you click *Finish*, only Site 1 and Site 2 will be acquired. Site 3 and Site 4 will not.

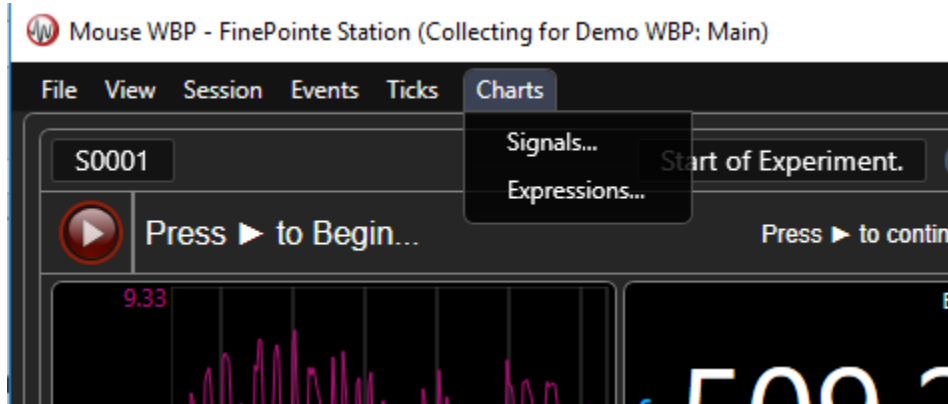
After you have assigned subject IDs to the sites you will run, click the **Finish** button. FinePointe Station will begin acquiring live data.

**Note:** Step 3 of the Wizard is hardware calibration which should have been performed prior to launching station. Since we've already calibrated the sites, there is no need to repeat the process.

## CONFIGURING VIEWS FOR THE FIRST TIME

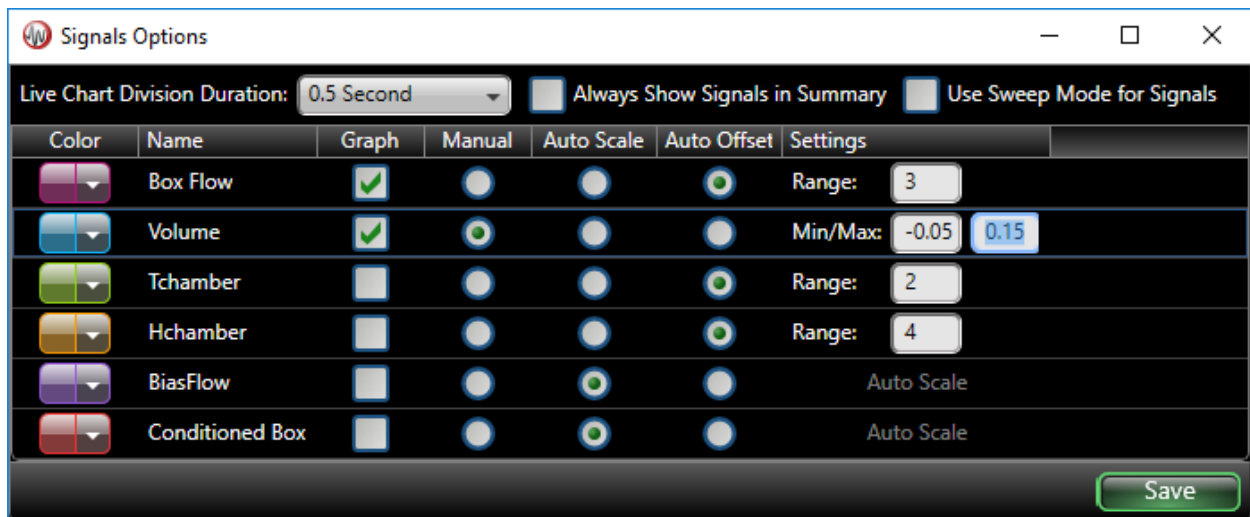
If you are running for the first time, you may need to arrange the views. While you should feel free to pick an arrangement that suites your needs best, the following is a recommended arrangement for WBP applications.

1. Select **Charts | Signals** on the main menu on the summary display



*Figure 62. This picture shows you where to find the Chart->Signals menu.*

2. Select the recommend Signals Options as indicated in Figure 63 and click **Save**.



*Figure 63. Recommended Signal View options for WBP acquisitions.*

3. Select **Chart | Expressions** from the main menu. This configures the parameters displayed on the Dashboard and Trend Graphs. Select the recommended Expression Options as indicated in Figure 64. See the **Derived Parameters** section of this manual for definitions of each parameter below.



**Figure 64.** This shows a recommended Expressions view setup.

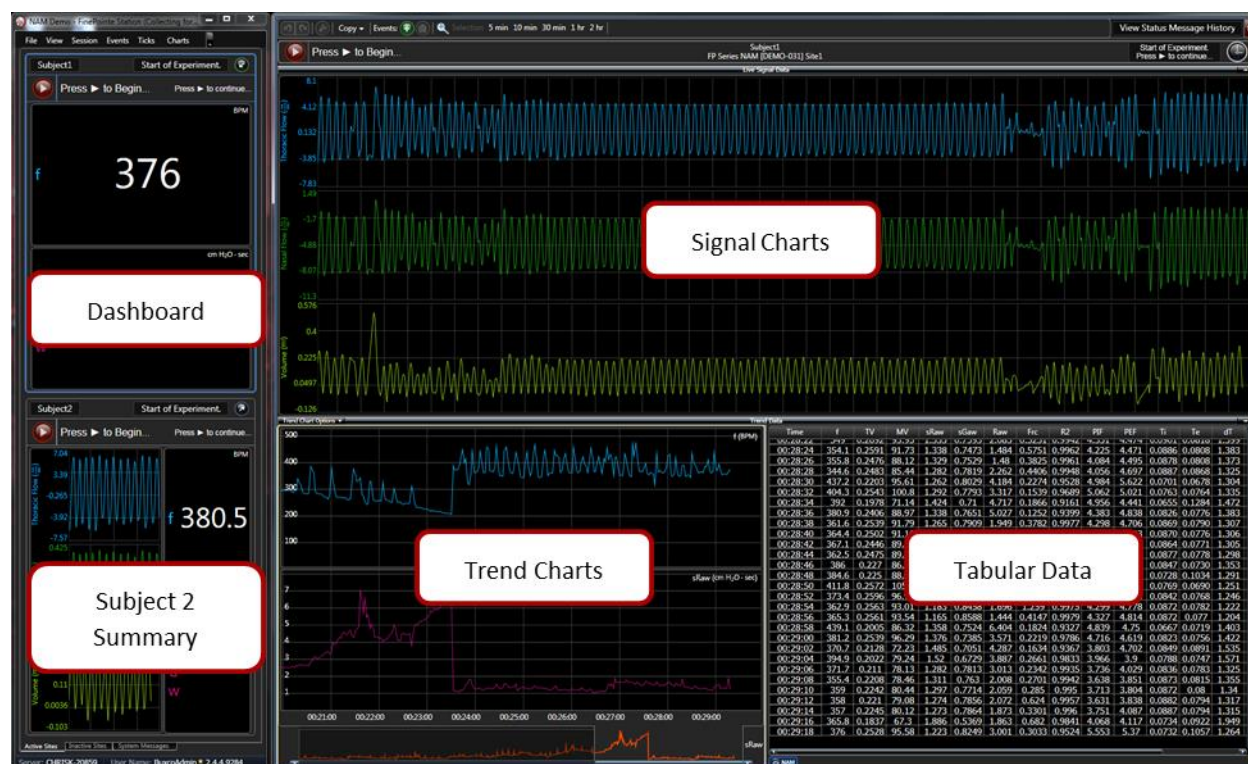
4. FinePointe Station provides 2 kinds of views: summary view (only 1), and detail views (one for each site). The summary view shows you a summary of all your sites on a single page. The detail view shows full detail and content of a single site.

The View menu located on the summary view allows you to select from many predefined arrangements. You can even design and save your own if you choose.



**Figure 65.** This shows the view menu for a computer with 2 monitors. If you have 4 or more monitors, additional views will also appear. If you have only one monitor, you will not see Views That Span Two Monitors.

Figure 66 displays the layout of the Summary/Detail View circled in Figure 65.

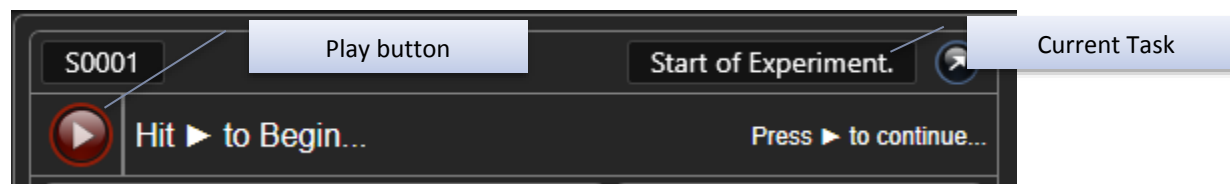


**Figure 66. Displays the layout of the Summary/Detail View circled in This shows the view menu for a computer with 2 monitors. If you have 4 or more monitors, additional views will also appear. If you have only one monitor, you will not see Views That Span Two Monitors.**

## STEPPING THROUGH THE TASK SEQUENCE

FinePointe Station provides a task sequence that allows FinePointe to walk through your data collection tasks with you. FinePointe allows each site to be acquired independently. Each site can be at a different point in the data collection task sequence at any given time. However, if the sites are not actually independent (e.g. they all share a nebulizer), then you will have to run all the sites together, synchronized.

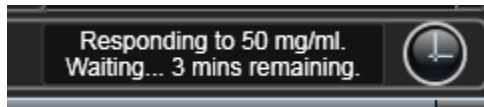
On the summary view and on each detail view, FinePointe provides a task sequence control console.



**Figure 67. An example FinePointe Station console.**

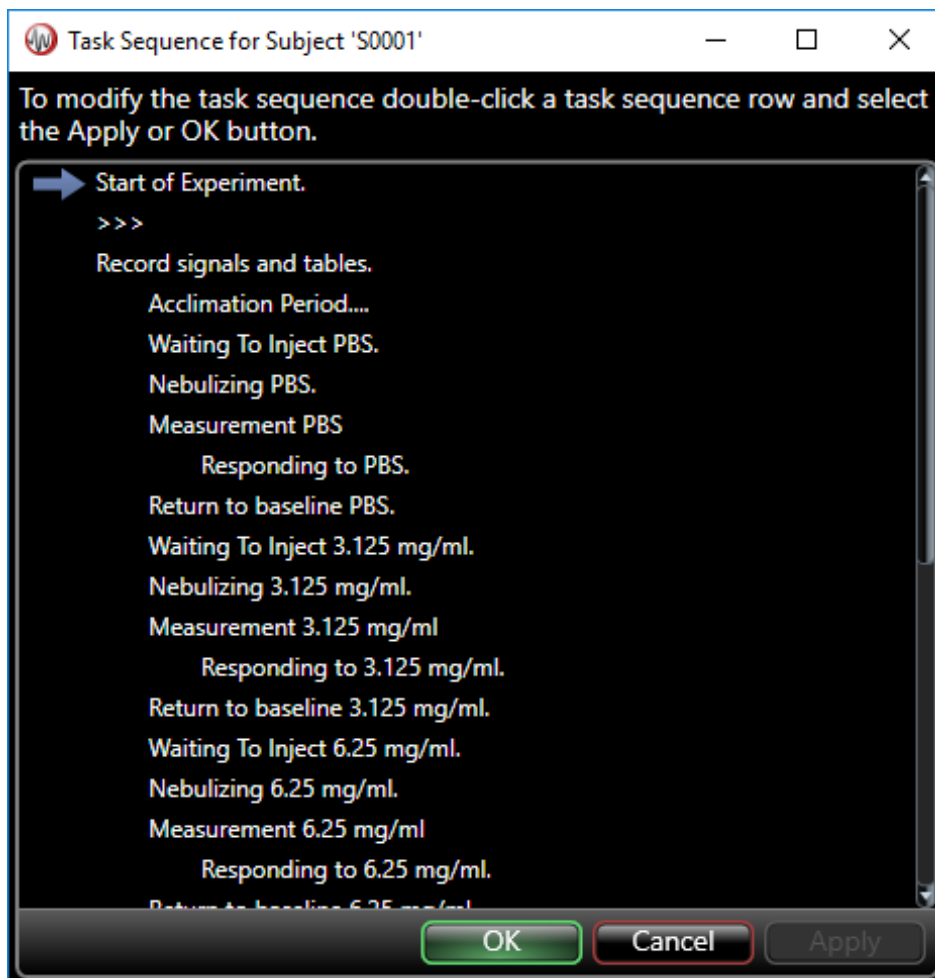
This console displays:

- Where the subject is in the current task sequence (current task).
- What, if anything, the user may do, and a button (**Play** button) to say the task has been completed.
- If it is in the process of executing something, what is the progress. Usually FinePointe displays the amount of time remaining for the current step here.



**Note:** Task Sequence status and action information for each site is also displayed on the FinePointe WBP console bar.

In the example shown above (Figure 67) the console says "Hit ► to Begin..." This message informs the user what can be done at this time. The Current Task is indicated as "Start of Experiment". If this text is clicked, a dialog box opens outlining the complete task sequence. Click **Cancel** to close the window.



**Figure 68.** An example task sequence for a dose response study.

FinePointe executes the task sequence from the first step to the last step. By reading this, users can see what is needed to acquire data for this study. In this example, FinePointe waits for the user to begin. At this point, ensure the apparatus is properly setup and the data being acquired from the animals looks good.

When you are ready, click the ► (play) button. FinePointe starts the recording and begins timing the acclimation period. The acclimation period may be interrupted by pressing the ► button again.

Next, FinePointe waits for the user to deliver the first challenge (PBS); e.g. add the compound to the nebulizer.

Once nebulizer(s) is full, press the ► button again to commence aerosolization and mark the beginning of the measurement interval. Once complete, FinePointe will wait for the next challenge concentration to be loaded into the nebulizer.

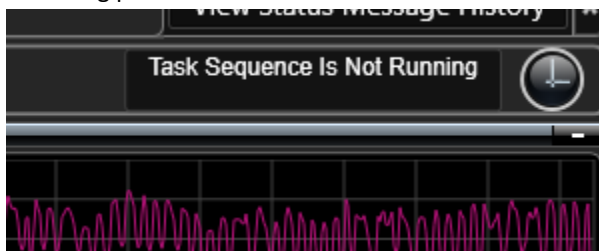
The arrow indicates the current task. Users may select a task and click **Apply** if to skip to that task; however, this should only be necessary in unusual circumstances.

To run multiple the sites together, strike the <F12> key to hit ► on all the Sites at once. Make sure the summary window is selected, otherwise the <F12> button press may end up going to another window (and FinePointe will not be aware of it).

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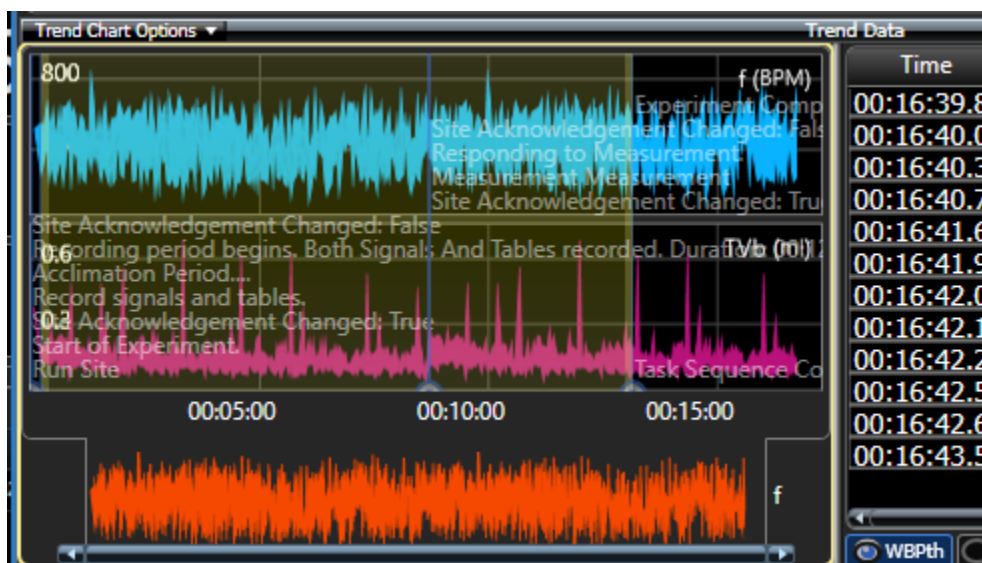
## ADJUSTING RECORDED DATA INTERVAL

After the task sequence has completed, it will indicate that it is done and update the trend graph with the recording period.



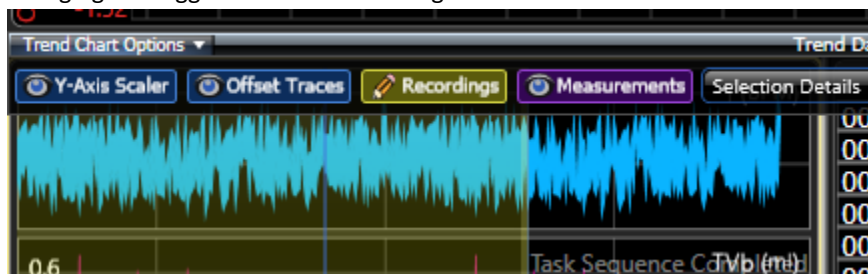
**Figure 69.** The task sequence status message that indicates that the task sequence has completed.





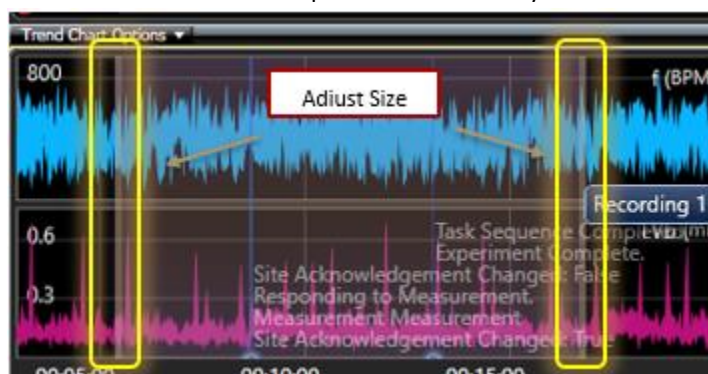
**Figure 70. Trend graph with a recording period plotted on it.**

At this point, users may adjust the recording period such that more or different data is saved in the FinePointe study database. To do this, set the *Trend Chart Options* such that the **Recording** period can be modified by changing the toggle to the **Pencil** setting.



**Figure 71. The Recordings toggle is set to the Modify Recordings position.**

Click-and-drag the edges of the recording interval to make it larger (i.e. to record more data in the study database) and grab the rest of the recording interval to move it. FinePointe will prune out the data which is not part of this interval and it will not be imported into the study database once the acquisition session is ended.

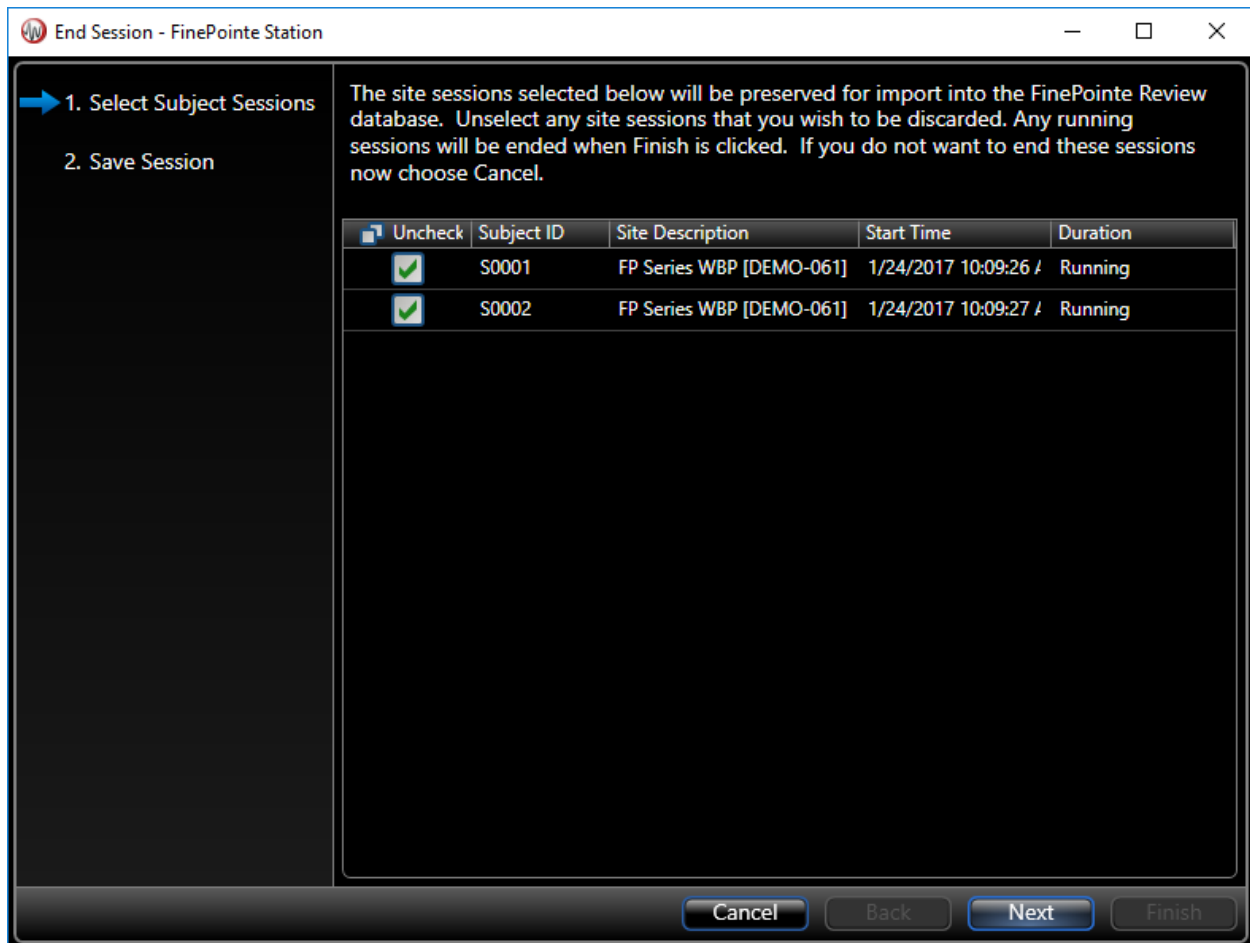


**Figure 72. Select and adjust the recording period**



## END DATA ACQUISITION

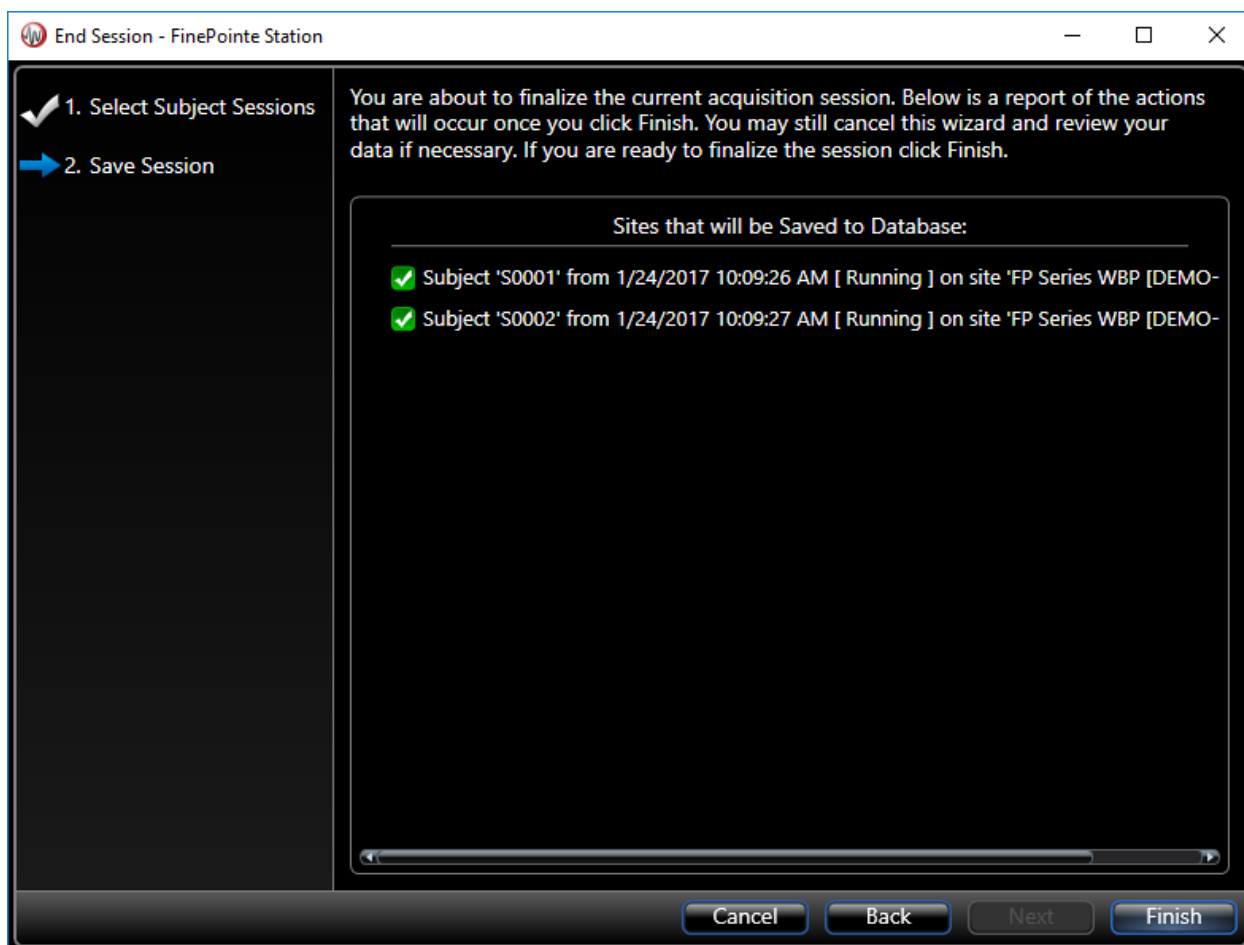
Once the data collection task sequence has completed, select the **File | End Session** menu on the summary window. The *End Session* wizard is presented.



**Figure 73.** The first page of the *End Session* wizard. Select the subjects you want to save to the database. By default, they are all selected.

The default is to save ALL data; click **Next**.

However, if a subject is unchecked here, its data will **not** be uploaded into the study database. Only do this if the data is absolutely not wanted. Typical reasons may be the animal had to be removed midway through due to complications or if the study had to be terminated prematurely and another collection session will take place later.

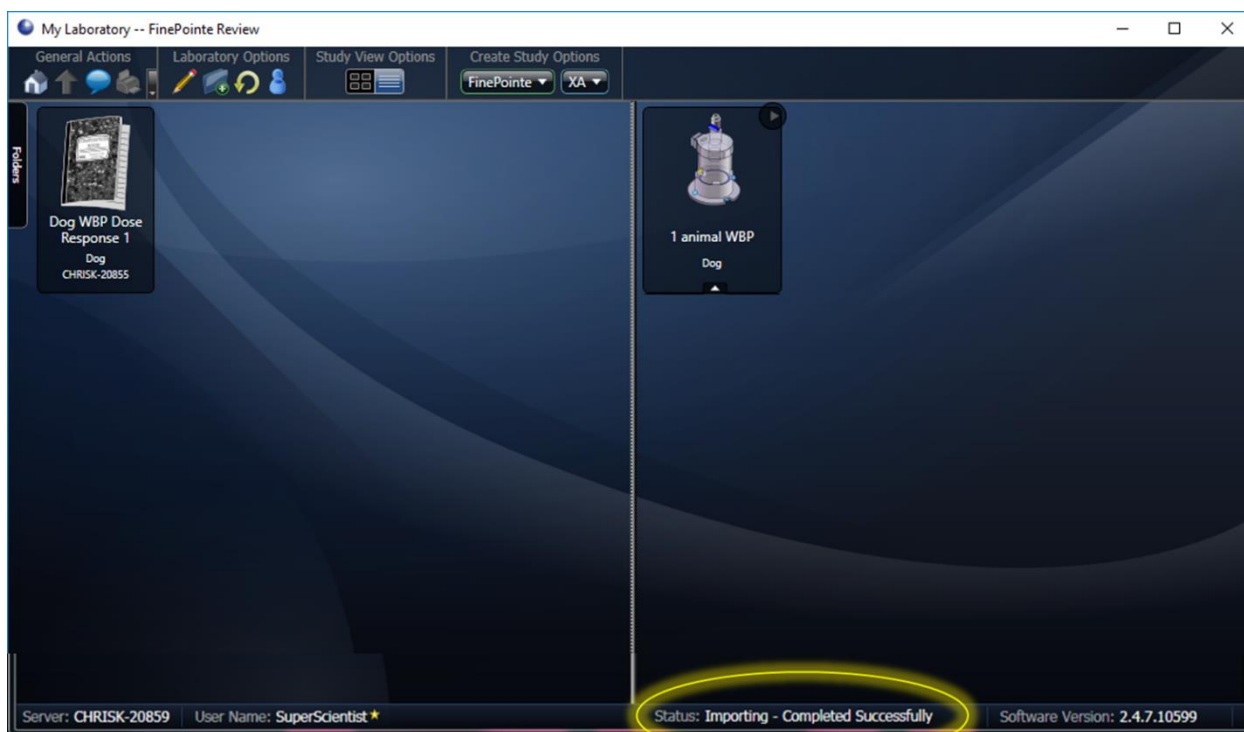


**Figure 74. The final page of the End Session wizard. This page confirms what you selected on the first page.**

The final page of the wizard confirms what was selected on the first page. If satisfied, click **Finish**. Otherwise, click **Cancel** or **Back**.

If **Finish** is clicked, FinePointe will begin the process of importing the data into the study. This can take a few minutes. It is recommended to wait until data has been fully imported before starting the next data acquisition session.

The status of the data importing process is provided at the bottom of the FinePointe main *Laboratory Page* (Figure 75).



**Figure 75. Data import status located at the bottom of the main Laboratory Page.**

During the data import, a **Pruning** status may be seen. When FinePointe Station is launched, data will start being acquired by the system. However, the task sequence defined during Study creation will not commence until the user clicks the Acknowledge button ► to **Start Experiment**. Similarly, once the final task sequence step is complete, FinePointe will continue to acquire data until the users chooses to **End the Session**. All data collected prior to the Start of Experiment and after the completion of the final task sequence step will be pruned, or remove and not saved, prior to importing the experiment data.

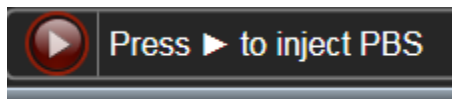
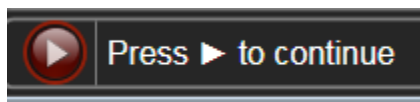
Pruning will also remove any data collected during any **Acclimation** period included in the task sequence.

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## MORE ABOUT EXECUTING THE EXPERIMENT

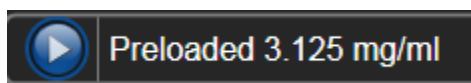
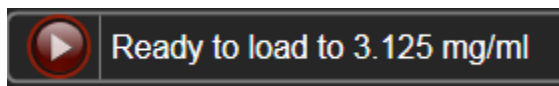
The experiment is designed to follow the Task Sequence that was created earlier. To ensure the experiment is properly conducted, some interaction is required by the researcher.

A red arrow ► indicates that the experiment will not continue unless the researcher acknowledges the task sequence by following the on-screen instructions. Some examples are shown below.

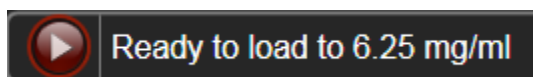
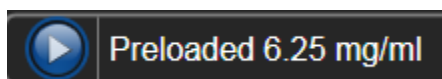


A blue arrow ► indicates that the researcher has acknowledged the next step in the task sequence and FinePointe will automatically execute the next step in the task sequence.

In the example below, FinePointe indicates the next step "Ready to load 3.125 mg/ml". Once the researcher has preloaded the nebulizer head, they can acknowledge the next step by clicking on the red arrow ►. Once acknowledged, the arrow turns blue ►. FinePointe will proceed as outlined in the task sequence.



If the task sequence is accidentally acknowledged, click the blue arrow ► again. The arrow will turn back to red ► and the task sequence will not continue until acknowledge by the researcher.



## STUDY PAGE

Once you've collected data, FinePointe returns to you to the main Laboratory Page. A summary of the data collected, and reports generated can now be viewed in the main Study Page.

To launch the Study Page, double-click the **Study Notebook** icon.



**Figure 76. Example Study Notebook icon.**

An example of a fully populated Study Page is displayed in Figure 77. Upon initial study creation, the Report Area will have a single report listed, while Report Preview and Recording List will be empty.



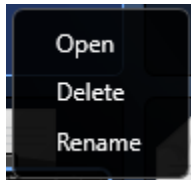
**Figure 77. The main Study Page with key area indicators.**

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## REPORT AREA

The Report Area presents a list of icons, each icon representing a report. New studies are generally created with one report. Addition reports may be added. When a report is selected, single-clicking on it, the Report Preview Area presents a preview of it. Double-click on a report to open it up and view the complete report.

Right-click on a report to get a context menu containing certain actions that can be performed, as described below:



**Figure 78. Report Area right-click context menu.**

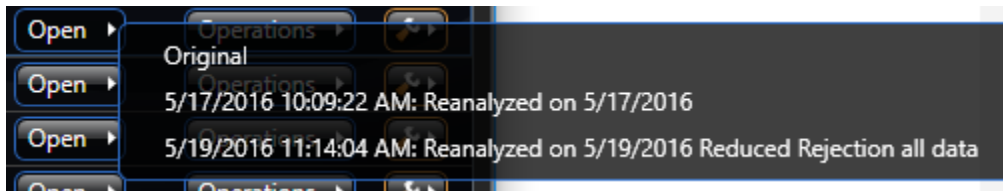
Menu Item	Description
Open	Same as double-clicking on the report. Opens it, presenting the complete report.
Delete	Delete the report.
Rename	Rename the report

---

## RECORDINGS LIST

The Recordings list presents a row for each recording saved in the study. The columns provide details about the recording. The **Open** button opens the recording in the *Detail View*.

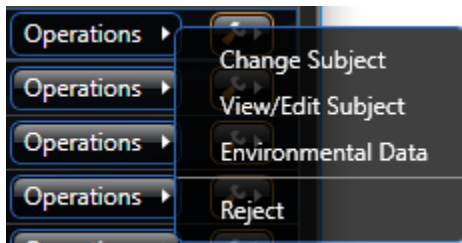
If a reanalysis of the recording is necessary, then more than one recording set will be available for opening. In that case, Open may present options if clicked.



**Figure 79. Example options available from the Open button. Options will depend on number of reanalysis times.**

Choose the desired recording set to review in the *Detail View*.

The **Operations** button opens a set of operations that may be performed on the recording.

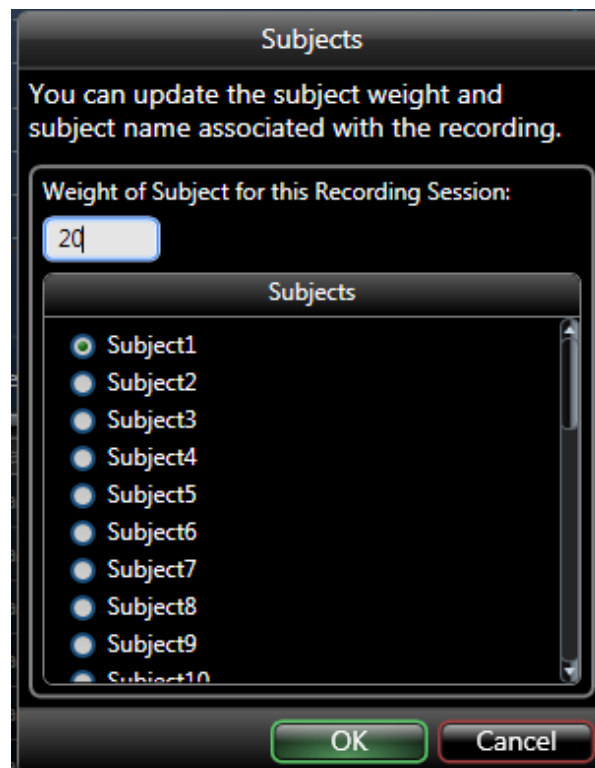


**Figure 80. Displays the options available from the Operations button.**

## Change Subject

Presents a form permitting the subject associated with the recording to be changed by selecting a different subject ID in the list. Also, the weight specified here is the weight of the subject associated with the recording.

Refer to this value in analyzer expressions and report expressions by using the **Weight** keyword.



**Figure 81.** An example *Change Subject* form.

## View/Edit Subject

form displayed below presents the subject record of the subject associated with the recording. This is the same record which is accessible from the Subjects and Groups page. When the weight is change in this form, only the weight that will be applied to subsequent recordings with this subject will be changed, not the weight associated with the current recording.

**Figure 82. An example Edit/View Subject form.**

Environmental Data

The Environmental Data form shown in Figure 83 permits environmental conditions to be edited. This information is used for PFT FRC analysis and is not used by WBP analysis.

**Figure 83. An example Environmental Data form.**

Reject

Rejects the recording so it will not be used by the reports.

The last column which has a **wrench** button on each row shows the calibration used for that recording. In the following example, Box Flow has an effective range between 89.59 and -89.1 mL/sec.

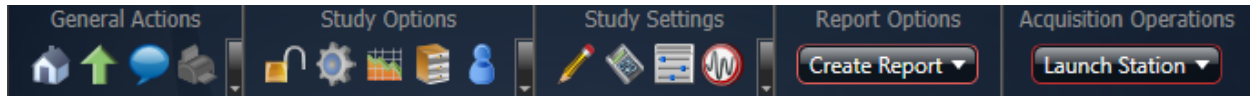
**Figure 84. An example of information located in the Wrench button.**



## COMMAND BAR

The command bar is a context-sensitive bar that provides buttons for navigation and information editing.

The command bar on the Study page is pictured below:














Each button is a command. The command will either bring up a dialog box or navigate you to another page. When you hover the mouse of each button, the tooltip provides a reminder of what the button will do.

On this command bar, there are 3 sub-command bars. Each sub-command bar is indicated by the small down bar and contains less frequently used commands:





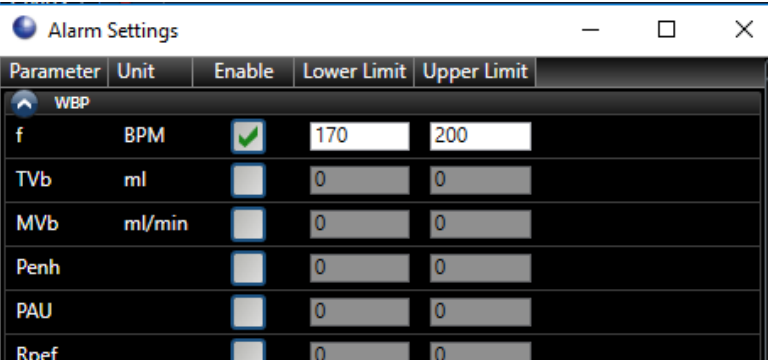



**Figure 85.** This signifies a sub-command menu. When you click on it, it will reveal additional command buttons.

The following table summarizes each command button:

Icon	Name	Description
	Laboratory Home	Navigate to the main Laboratory Page
	Up One Level	Navigate to the next page up (or back)
	Chat Room	Bring up the FinePointe Chat room.
	Print	Print the current page (if the current page is a printable page)
	Release control of study	Since FinePointe is a network-based system and multiple users can access the data in the study simultaneously, FinePointe only permits one user to have control of the study and make certain changes at a time.
	Manage Groups and Subjects	Navigate to the Groups and Subjects page.
	View Data and Place Measurements	Navigate to the Place Measurements View.
	View Source Data for Measurements	Present a form that allows you to view the data selected by each measurement interval. This form allows you to audit the data used in the reports.
	Manage Study Users	Navigate to the Study Users page.
	Study Settings	Present a wizard that allows you to change the study descriptive information, measurements, phases, and task sequence settings. This wizard is similar to the Create Study wizard used to create the study.
	Analyzer Expressions	Present a form which edits the expressions of the columns of each analyzer table. This form allows you to decide what columns to compute, show and hide. It also allows you to create custom parameters by means of mathematical equations, which

<b>Icon</b>	<b>Name</b>	<b>Description</b>
		can then be viewed during data collection and reporting.
	Acquisition Settings	Present a form which allows you to set the default algorithm settings for subsequent data acquisition.
	Reanalyze Recordings	Present a wizard that allows you to reprocess the stored waveforms of recordings to produce a new analyzer set. This does not delete previously stored analyzer sets, and you will have to select which analyzer set you wish to base the reporting on.
<b>General Actions Sub-command bar</b>		
	Transfer Collected Data to Server	When data is acquired using an Isolated Station, use this button to bring in the acquired data from a recording file stored on a flash drive.
	System Audit Trail	Present a form that shows the System Audit Trail.
	Calibration Audit Trail	Present a form that shows the Calibration Audit Trail.
	Save FinePointe Service Logs to the FinePointe Logs.zip on the Desktop	This button collects all service logs currently accessible on the server and all connected clients and saves them into a zip file on the desktop. This button is useful for collecting information for diagnostic purposes.
	Log off	Log out of FinePointe.
	Change Password	Change your password.
<b>Study Options Sub-command bar</b>		
	View Study Audit Trail	Present a form that shows the Study Audit Trail.
	View Study Information	Navigate to the Study Info page. This page provides a simple summary of the study.
	Verify Database Integrity	Present a form that scans the study database of modifications which took place outside of FinePointe. It presents a list of changes.
	Repair Database	If changes were detected by Verify Database Integrity, this button will correct the change codes so that those changes will not be detected by future Verify Database Integrity operations. All corrected change codes are logged to the audit trail, so a record of those changes remains.
	Export All Subject Data to Excel	Launches an export dialog which permit user selection of the subject, analysis set (e.g. original or reanalysis), and analyzer for data export to Excel.
	Export All Subject Data to Excel	Exports all recorded analyzer data from all subjects in the study to Excel. Depending on the size of the study (number of subjects and acquisitions) this operation may take an extremely long time and could fail since Excel may not be able to store all the data due to limitations of Excel.
	Export All Subject Data to Open Office	Exports all recorded analyzer data to Open Office.
	Export All Subject Data to Text File	Exports all recorded analyzer data to a folder containing text files.
	Copy Data to Study	Copies selected recordings into another study which is compatible.
	Export All Reports to Excel	Exports data from all defined reports in the study to Excel.

Icon	Name	Description
<b>Study Settings Sub-command Bar</b>		
	Modify Reanalysis Descriptions	Present a form that allows you to modify the descriptions associated with each reanalysis set.
	Include/Exclude Reanalysis	Present a form that allows you to select which reanalysis sets to use in the reports.
	Annotation Hot Key Configuration	Present a form that allows you to set the descriptions of 4 manual events which are placed during data collection when F5, F6, F7, and F8 are pressed.
	Alarm Settings	<p>Allows the user to define alarm conditions per derived parameter using low and high alarm limits. When the derived data goes above or below the defined alarm limits, an alarm will be triggered. During Acquisitions, a triggered alarm will generate an audible standard Windows alarm sound. In Acquisition and Review, a triggered alarm will be indicated in the Derived Parameter Table by updating the offending data cell's background color to red. For example, if the frequency (f) derived parameter alarm was configured to Low: 170 and High: 200.</p>  <p>This resulted in the following updates to the Derived Parameter Table to indicate these logged times met the alarm condition:</p>  <p>When exporting derived data from FinePointe Review, an Alarm column will be included with an asterisk in the row of the parameter to indicate an offending data.</p>

In addition to the command buttons, the Command Bar provides a button for creating reports, and a button to launch data collection. Pull down the **Create Report** button to see the reports you can create. See **Creating a Report** for more details.

Pull down the **Launch Station** button to select a station on which to acquire data. Only stations that can acquire data for this study are presented.

## REPORTS

FinePointe provides an integrated report generation facility which helps you produce meaningful summaries of your data. When you acquire data in FinePointe, you can easily record thousands of the derived data lines for a single subject in the WBP table. Working with this data in Excel can be extremely cumbersome simply because of the sheer size of the data, but also it is usually more convenient to visualize the data graphically, annotated with event marks that inform you what occurred at each moment. Excel does not make this easy. FinePointe does.

The reporting engine allows you to select and identify regions of data, reject noise, combine groups of subjects, and produce tables and graphs of your data. All this is done within the FinePointe Study database, creating a traceable result which is kept together with the raw data. In addition, you can acquire data from more subjects, and simply add those subjects to their appropriate groups to include them in existing reports.

### REPORT PROCESSING

FinePointe offers four report types: Dose Response (or Toxicity which is essentially the same report with a different name), PC Dose Report, Parameter Summary, and Time Course. The processing is very similar for each of these and summarized in the following table:

Report Type	Description
<b>Dose Response (AKA Toxicity)</b>	Summarizes one or two expressions for multiple measurements and multiple groups.
<b>PC Dose Report</b>	Generates the same content as a Dose Response report but also computes PC-n value for each group. Most common would be PC-200 which is the concentration that yields 200% change.
<b>Parameter Summary</b>	Summarizes many expressions for a single measurement and multiple groups. The processing of this report is the same as that of Dose Response, but permits many expressions.
<b>Time Course</b>	Summarizes an expression for multiple measurements, each subdivided into fixed intervals (specified by you) and multiple groups.

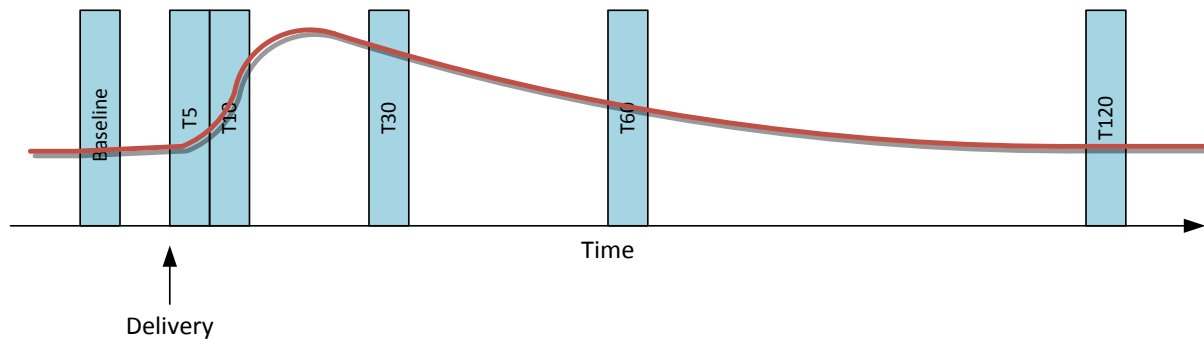
When you create a report, you specify one or more groups, one or more measurements, and one or more expressions. From this information, the reporting engine is able to process the derived data, and for each group-measurement-expression combination produces average, standard deviation, standard error and other calculations.

To illustrate the report processing, consider the following collection protocol:

1. Take a 5-minute baseline average (named "BASELINE")
2. Deliver a compound
3. Take a 5-minute average 5 minutes after delivery (named "T5")
4. Take a 5-minute average 10 minutes after delivery (named "T10")
5. Take a 5-minute average 30 minutes after delivery (named "T30")
6. Take a 5-minute average 60 minutes after delivery (named "T60")

7. Take a 5-minute average 120 minutes after delivery (named “T120”)

If you visualize the data collection for a single subject, it might look something like the diagram in Figure 86. An example data collection protocol to be summarized by FinePointe reports.



**Figure 86. An example data collection protocol to be summarized by FinePointe reports.**

The plot is of a parameter which represents the subject’s response. The areas shown as blue shaded areas are measurements. Each measurement has a name which identifies it.

In addition, imagine you acquire data for 8 subjects according to the data collection protocol, and the subjects are arranged in 2 groups of 4 subjects, Groups A and B. We have subjects A1, A2, A3, A4, B1, B2, B3, B4.

FinePointe station can place the measurements for you as you acquire the data, according to the data collection protocol. But you are free to adjust the placement of these measurements, both position and width, from the Place Measurements View. Also, the Place Measurements View allows you to reject regions of data which you do not want considered for reporting.

The processing FinePointe performs when producing a report is as follows:

1. Determine all subjects of the report from all the groups associated with the report.
2. For each subject, remove rejected data, then compute the expressions on each measurement. The result of this is the subject summary data.
3. For each group, combine the data for each measurement (from the subject summary data). The result of this is the group summary data.

In the example above, for each subject referenced by the report, FinePointe computes the average of the data within the Baseline, T5, T10, T30, T60, and T120 measurements.

Within FinePointe the Subject summary data may look like the following table:

Subject								
Measurement	A1	A2	A3	A4	B1	B2	B3	B4
Baseline	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
T5	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
T10	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx

<b>T30</b>	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>T60</b>	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>T120</b>	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx

Next, FinePointe groups the data and produces a group summary table:

Group										
	A					B				
Measurement	Average	Stdev	StdErr	N	CI+/CI-	Average	Stdev	StdErr	N	CI+/CI-
<b>Baseline</b>	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>T5</b>	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>T10</b>	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>T30</b>	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>T60</b>	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>T120</b>	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx

Additional parameters are also computed for the group summary, such as P value, and T Test.

## TIME COURSE REPORT

FinePointe also provides a special report named a “Time Course” report. The processing of the Time Course report is very similar except for one key difference. A Time Course report subdivides each measurement into fixed time intervals and treats each subdivided time interval as a separate measurement.

For example, you could produce a Time Course report of Baseline measurement, with a time interval of 1 minute. For the Baseline measurement, FinePointe would produce 5 values in the Subject summary data, one for each subdivision, since the measurement is 5 minutes long.

Subject									
Measurement	Interval	A1	A2	A3	A4	B1	B2	B3	B4
<b>Baseline</b>	1	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>Baseline</b>	2	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>Baseline</b>	3	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>Baseline</b>	4	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>Baseline</b>	5	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx

And the Group summary data for the Baseline measurement would follow with 5 sets of numbers for each group.

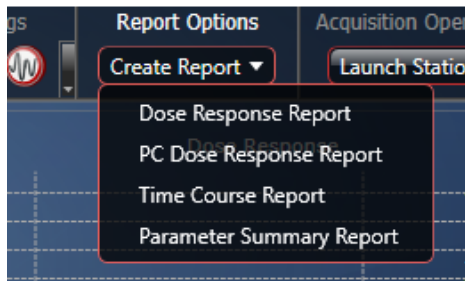
Group											
		A					B				
Measurement	Int	Average	Stdev	StdErr	N	CI+/CI-	Average	Stdev	StdErr	N	CI+/CI-
<b>Baseline</b>	1	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>Baseline</b>	2	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>Baseline</b>	3	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>Baseline</b>	4	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx
<b>Baseline</b>	5	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx	xxx.xx

---

## CREATING A REPORT

To create a report:

1. Select the **Dose Response Report** from the **Create Report** button to on the study page.



**Figure 87. The available report options from a Dose Response or Universal study.**

### 2. Page 1 – Configure Report.

Specify a **Report Name** that is unique within the study. Optionally, add a **Description**.

- a. Select a **Normalization** method – choose to have the data reported as a deviation from, percent deviation from, or a percentage of a designated baseline measurement, or just report the numbers without normalization.
- b. Since this report produces charts, choose between line or bar charts.
- c. Optionally, specify an X-axis title which will appear on the charts.
- d. Click **Next**.

Create Dose Response Report

➔ 1. Configure Report

2. Select Measurements and Configure Parameters

3. Configure Groups

Choose how the data in the report will be represented.

Report Name:

Description:

*enter report description (optional)*

---

Normalization:

☒ None (Raw data)

☐ Deviation from Baseline

☐ Percent deviation from Baseline

☐ Percentage from Baseline

Chart Type:

☒ Line Charts

☐ Bar Charts

---

X-Axis Title:

X-Axis Label Unit:

Cancel
Back
Next
Finish

**Figure 88.** The first page of the Dose Response wizard. The Toxicity report wizard is identical.

### 3. Page 2 – Select Measurements and Configure Parameters.

Select the measurements and parameters to include in the report.

- a. Place a check by each measurement to be included.
- b. If a normalization method is selected on the previous wizard page, indicate which measurement is the baseline measurement.
- c. Specify the expressions to compute for each measurement. The expression can be different for each measurement if desired, or they can be the same. Click the **New Parameter** button to bring up the form that allows you to edit the expression.



Measurement ID	Dose/Value	Is Selected	Is Baseline	TVb	
Saline	0	<input type="checkbox"/>	<input checked="" type="radio"/>	Avg	
6.25 mg/ml	6.25	<input checked="" type="checkbox"/>	<input type="radio"/>	Avg	
12.5 mg/ml	12.5	<input checked="" type="checkbox"/>	<input type="radio"/>	Avg	
25 mg/ml	25	<input checked="" type="checkbox"/>	<input type="radio"/>	Avg	
50 mg/ml	50	<input checked="" type="checkbox"/>	<input type="radio"/>	Avg	
100 mg/ml	100	<input checked="" type="checkbox"/>	<input type="radio"/>	Avg	

**Figure 89. The second page of the Create Dose Response report wizard.**

- d. The Parameter Builder assists in specifying expressions which summarize each measurement. The parameter builder has two tabs: **Quick Builder** and **Advanced Builder**. The **Quick Builder** tab allows you to make a couple simple selections, and it will create the expression for you. This can be used for many common expressions, especially expressions which are based on one parameter. The **Advanced Builder** allows you to build more complex algebraic combinations of parameters and functions. For more information on the Advanced Builder, please see the **New Parameter Advanced Builder** section of the Appendix.

Using the **Quick Builder**, you can select one parameter from the available parameters derived on the site and one of the common functions to compute on that parameter. For example, if you wanted the average respiratory rate, click the “TVb” parameter under **WBP** and the **Average** function.

**Parameter Builder**

Quick Builder   **Advanced Builder**

Choose a single parameter from the top group and a function from the bottom group.

**Analyzer Parameters**

WBP		Apnea	
<input type="radio"/> f	<input checked="" type="radio"/> TVb	<input type="radio"/> Nsigh	<input type="radio"/> Psigh
<input type="radio"/> MVb	<input type="radio"/> Penh	<input type="radio"/> Psniff	<input type="radio"/> Napnea
<input type="radio"/> PAU	<input type="radio"/> Rpef	<input type="radio"/> Papnea	<input type="radio"/> Tapnea
<input type="radio"/> Comp	<input type="radio"/> PIFb	<input type="radio"/> Napnea0	<input type="radio"/> Papnea0
<input type="radio"/> PEFb	<input type="radio"/> Ti	<input type="radio"/> Napnea1	<input type="radio"/> Papnea1
<input type="radio"/> Te	<input type="radio"/> EF50	<input type="radio"/> Napnea2	<input type="radio"/> Papnea2
<input type="radio"/> EIP	<input type="radio"/> EEP	<input type="radio"/> Pnormal	<input type="radio"/> Perratic
<input type="radio"/> Tr	<input type="radio"/> TB		
<input type="radio"/> TP	<input type="radio"/> Rinx		

**Functions**

☒ Average   ☐ Maximum   ☐ Minimum   ☐ Area

**OK**   **Cancel**

**Figure 90.** The Parameter Builder form which allows you to edit an expression which is computed for over the measurements.

- e. Click **OK** to return to the report wizard.
- f. One additional New Parameter may be added (total of two parameters), if desired.  
*Note:* One or two parameters are permitted, depending on report type.
- g. Click **Next**.

#### 4. Page 3 – Configure Groups.

The final page defines which groups to summarize. The **All Subjects** group is always available, and if additional groups have not yet been created, it will be the only group available. Additional groups may be added later. In the example, A01, C01, A02, and B01 groups have been selected. The order in which the groups are summarized may be changed by clicking the up or down buttons beside each group.

**Create Dose Response Report**

Choose the groups that will be used in this report. You may also arrange the order in which they will be displayed by moving each group up or down in the list.

Order	Include	Group	Move
1	<input type="checkbox"/>	All Subjects	▲ ▼
2	<input checked="" type="checkbox"/>	A01	▲ ▼
3	<input checked="" type="checkbox"/>	C01	▲ ▼
4	<input checked="" type="checkbox"/>	A02	▲ ▼
5	<input checked="" type="checkbox"/>	B01	▲ ▼

☒ Check All

Cancel Back Next Finish

**Figure 91.** The final page of the Create Report wizard.

#### 5. Click **Finish**.

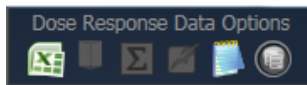
The new report is created, and processing begins on that data that is already contained within the study.

Once the Report is created, double-click the icon to view its contents.

## EXPORTING REPORT DATA

Once the data is recorded data and a report is generated, the user can open the report to view it and export it. Data may be export directly to Excel or copied to the clipboard and paste it in a third-party application. The options

that appear depend on the software installed on the computer and may include GraphPad Prism, SPSS, Excel, or Delimited Text.



**Figure 92.** Report export options available upon entry into the report.

*Note:* Derived data may also be exported from the FinePointe Study level using the Study Options icons. Please see the table located in the *Study Page Command Bar* section of this manual for further descriptions on the following export options:

- Export Subject Data to Excel
- Export All Subject Data to Excel
- Export All Subject Data to Open Office
- Export All Subject Data to Text File
- Copy Data to Study
- Export All Reports to Excel

## REVIEWING DATA

Now that data has been acquired and reported on, it may be necessary to review the signal data and augment measurement placement.

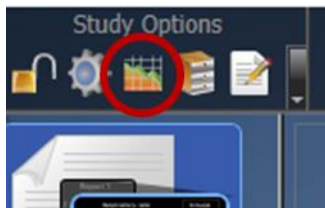
The FinePointe study database stores all the data associated with the experiment. Data is stored by recording. Each recording stores a complete session for a single subject and is presented on the main study page. Data may be reviewed using the same *Views* used during data acquisition. If interested in reviewing the Measurement, the **Place Measurement** page should be used.

---

### USING THE PLACE MEASUREMENT VIEW

The Place Measurements view allows users to quickly review, add, delete or adjust measurements. Any reports referencing these measurements will be automatically updated.

From the *Study* page, click on the **Place Measurements** view icon on the **Command Bar**.



**Figure 93.** The Place Measurements view icon.

FinePointe navigates to the Place Measurements view.



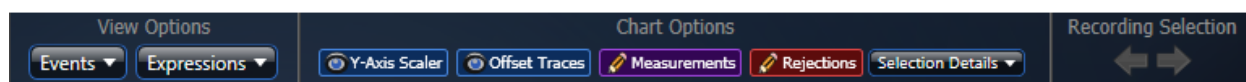
**Figure 94. An example Place Measurements view with data presented.**

Pictured in Figure 94 is the Place Measurement View. The lists on the left are the recordings to view. The bottom list shows the recordings, and the top list contains the groups. The group selection determines which recordings are shown in the recording list. If the **All Subjects** group is selected, all subjects will be available for selection from the lower list.

The area on the right contains parameter plots of the recordings. Each recording is presented with a plot of a single parameter acquired in the recording. In this example, 3 recordings are presented. The selected items in the recordings list determine which recordings to show in plots in the area on the right. Hold the **<Ctrl>** key down while clicking on the recording list to select multiple individual recordings. Hold the **<Shift>** key down while clicking on the recording list to select a block of recordings.

On each plot, there are purple shaded regions. Each region is a measurement. If you hover the cursor over the measurement, the tooltip indicates the dose name associated with the measurement. You can adjust the position or width of these measurements by dragging either the body or the edge of the measurement, respectively.

On the command bar along the top of the view, users may change the view settings.



**Figure 95. The Place Measurement view command bar.**

## VIEW OPTIONS

The following outline the *View Options* available from the *Command Bar*.

The **Events** button allows users to select the classes of events desired to annotate on each plot. By default, none are selected. The events provide important clues about specific actions that took place during data collection. Since FinePointe walks the user through the data collection procedure, it records the precise time when actions are performed. The following table summarizes the event classes:



Event Class	Description
System	Displays instances of system level events chronologically on the plot. Events added by the Biaera dosing device, ventilator settings, PFT test state, when algorithm settings are changed, and when the Play button is hit. These cannot be moved or deleted.
Manual	Displays instances of manually placed events - via right-click menus within the Place Measurement View or within FinePointe Review from the Historical Signal Charts - chronologically on the plot. Users can edit, delete or move these events as you need to.
Task Sequence	Displays task sequence events chronologically on the plot. Events are added each time a new task in the task sequence is started. These cannot be moved or deleted.
Task Actions	Displays task action events chronologically on the plot. Events are added any time the nebulizer is turned on, a measurement is added, or a recording period is added. These cannot be moved or deleted.
Antagonist	Displays antagonist events chronologically on the plot. Only used with Antagonist study type. Only one of these events is permitted per recording. This event indicates when the antagonist compound is introduced for the Antagonist protocol. This <b>can</b> be moved or deleted.
Time Zero	Only one of these events is permitted per recording. This event establishes the experiment time-zero.
Security	Displays any GLP security events that occurred throughout the acquisition. Events are added whenever a user relinquishes or gains control of FinePointe Station during data acquisition. These cannot be moved or deleted.

The **Expressions** button lets users select which parameter to plot on the recording plots. Any parameter recorded may be selected. Also, users can choose whether to auto-scale the Y axis on the plots. The most common setting for this would be to check **Auto Scale** and **Zero Based**.



## CHART OPTIONS

The following outline the *Chart Options* available from the *Command Bar*.




- **Y-Axis Scaler** is a toggle button which enables manual Y-axis scaling.

Toggle	Description
	Enable manual scaling on the Y-Axis. In this mode, drag the mouse along the Y-axis up or down to adjust the range.
	Lock scaling. In this mode, dragging the mouse up or down on the Y-axis does not adjust the range.


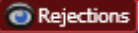

- **Offset Traces** is a toggle button which enables users to view or manually adjust the vertical placement of the trace on the plot.

Toggle	Description
 Offset Traces	Enable manual scaling trace adjustment. In this mode, drag the trace with the mouse up or down.
 Offset Traces	Lock trace offset. In this mode, dragging the mouse up or down on the trace does not adjust the vertical position.

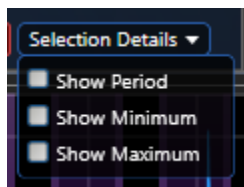
- **Measurements** is a three-way toggle button which controls the measurement interval presentation.

Toggle	Description
 Measurements	Enable adjustment of measurements. In this mode, users can drag the edges of a measurement to change the width or drag the body to change the position. Also, each measurement has a context menu which can be accessed by right-clicking on the measurement.
 Measurements	Measurements are visible but locked. In this mode, users cannot adjust the size or position of a measurement.
 Measurements	Hide the measurements.

- **Rejections** is a three-way toggle button which enables you to view, hide, or accept rejected regions (remove a rejected region). Rejected regions are shown as red regions. Users can create a rejected region in any toggle position.

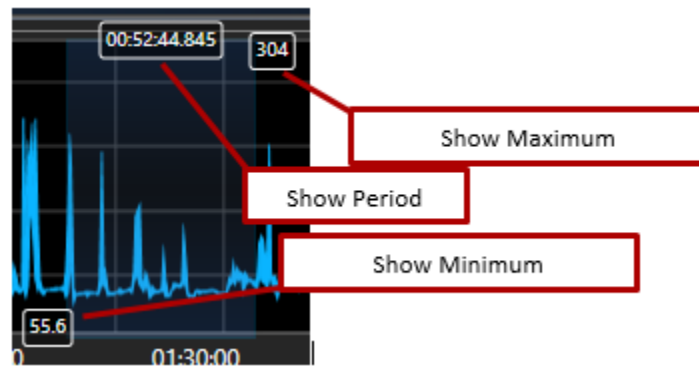
Toggle	Description
 Rejections	Enable full manipulation of rejected regions. In this mode, users can remove or accept rejected regions. Also, each rejected region has a context menu which can be accessed by right-clicking on the rejected region.
 Rejections	Rejected regions are visible but locked. In this mode, users cannot accept (or remove) any rejected regions.
 Rejections	Hide the rejected regions.

- **Selection Details** allows the user to see information about the trace when a range over the trace on a plot is selected.



- **Show Period** shows the width of the selected region.
- **Show Minimum** shows the minimum of the trace data within the selection.
- **Show Maximum** shows the maximum of the trace data within the selection.

See the example in Figure 96 interval and callouts to see what each check box enables.

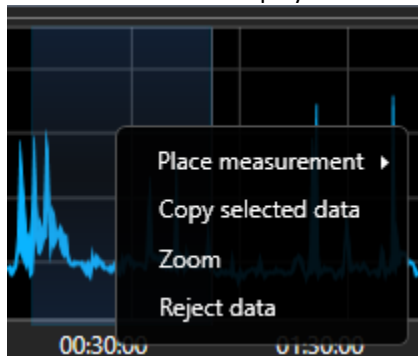


**Figure 96.** This shows a region of selected data on a plot. The Selection Details button allows the user to control the details about the selection to be seen.

- The **Recording Selection** buttons (two arrows) selects the next or previous group of recordings in the Recordings List. These buttons provide a convenient way to step through all the recordings without having to manually select the recordings each time.

## RIGHT-CLICK OPTIONS

When a range of data is selected on a plot (by click-and-dragging on the plot area, not a measurement), right-click the selected area to display a context menu as shown in Figure 97.

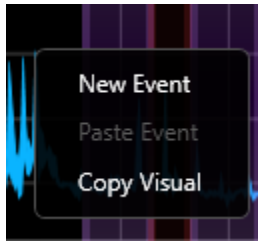


**Figure 97.** The context menu of a selected region on a plot.

- **Place measurement** is a submenu that allows users to place any measurements that have not yet been placed on this recording. Select the measurement to place and the selected region will become that measurement.
- **Copy selected data** copies the selected data to the clipboard. The numeric data is placed in the clipboard as text. An image of the entire plot is also placed in the clipboard. Users can paste this data into Excel or Word.
- **Zoom** adjusts the time axis so that the entire time axis is the width of the selected interval.
- **Reject data** creates a rejected interval to exclude the selected range from reporting. Users will be required to enter a reason for rejection.

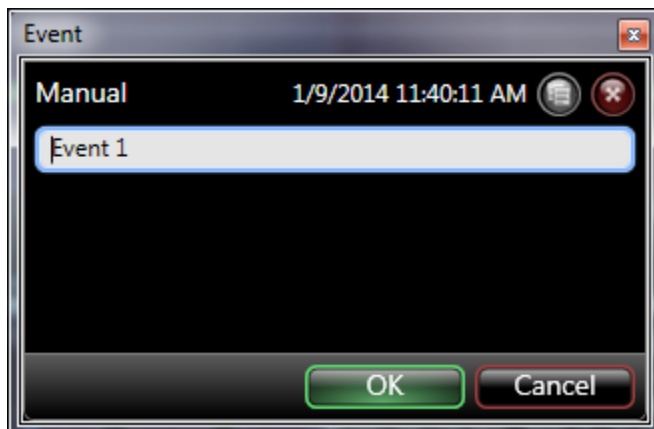
If the user right-clicks the background of the plot (without having anything selected through a click-and-drag), the following context menu becomes accessible, as shown in Figure 98.





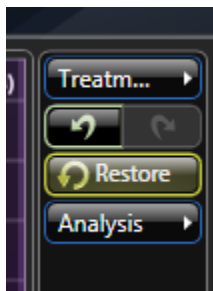
**Figure 98.** Context menu that appears when you right-click on the background of a plot.

- **New Event** allows users to enter a comment that is stored as an event with a **Manual** event class.
- **Paste Event** allows users to paste an event previously copied. An event may be copied from the Event dialog displayed when entering a new event or editing an existing event (Figure 99).
- **Copy Visual** copies an image of the plot to the clipboard. This permits the plot to be pasted into a third party application; e.g. Microsoft PowerPoint.



**Figure 99.** The Copy Event icon located in the Event dialog.

Additional options are available from the upper-right corner of each Recording Plot. These buttons perform operations on the subject associated with the plot.



**Figure 100.** An example subject control panel.

- The first drop down allows users to select the particular reanalysis to view.
- The **Undo** or **Redo** buttons allows the user to undo or redo a preformed action (such as moving a measurement).

- **Restore** allows the user to reposition all Measurements back to their originally placed locations as seen immediately after ending data collection and saving the data, thereby undoing any modifications that occurred after collection was finished.
- The bottom drop down allows users to Exclude or Include data.

## REVIEWING A RECORDING

From the main *Study* page, double-click on a recording to open it up.

Subject ID	Recording Time	Duration	Phase	Source	Status	Open	Operations
BP0066.04	5/13/2016 2:31:10 PM	1.3 hours	Measure 1	QT1001 WBP	Complete	Open	Operations
BP0066.05	5/9/2016 11:45:26 AM	1.3 hours	Measure 1	QT1001 WBP	Complete	Open	Operations
BP0091.01	5/9/2016 1:12:24 PM	1.3 hours	Measure 1	QT1001 WBP	Complete	Open	Operations
BP0091.02	5/9/2016 1:12:24 PM	1.3 hours	Measure 1	QT1001 WBP	Complete	Open	Operations

**Figure 101.** Recording list where you can double click on a row to open a recording.

This will launch the *Detail* page for that recording. This page is the same detail page presented when the data was acquired. Figure 102 shows an example view with the areas of the view labeled.



**Figure 102.** A Detail View of recording.

REVIEW COMMAND BAR

The Review Command Bar is composed of two bars: main bar and the context bar. The main command bar provides overall page setup buttons and commands. The context bar provides commands which may change based on what data is selected on the page.

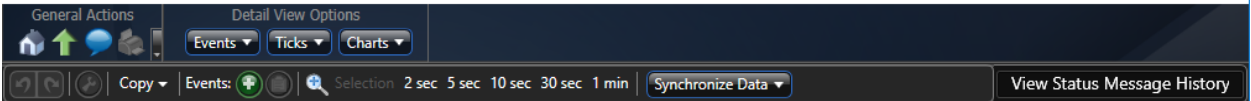





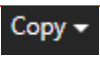


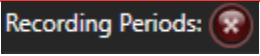

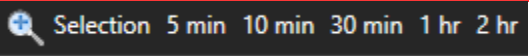
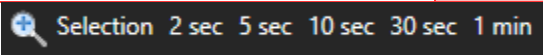
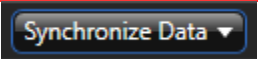
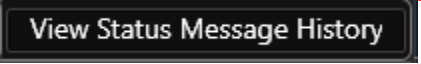
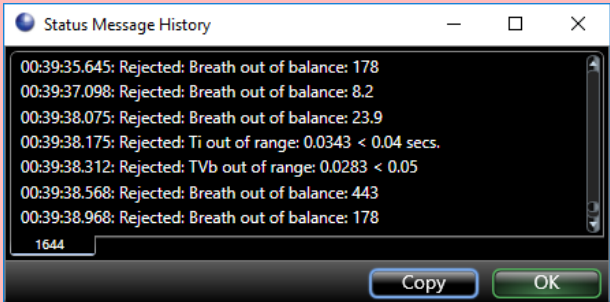


Figure 103. The Review Command Bar.

Button	Name	Description																																								
General Actions (See Command Bar)																																										
Detail View Options																																										
Events		Select which event classes to annotate the signals, trends and tables with.																																								
Ticks		Select which Ticks to place on the signals.																																								
Charts		Setup the Signals and Trends																																								
	Alarm Settings	<p>Allows the user to define new or manipulate existing alarm conditions per derived parameter using low and high alarm limits. When the derived data goes above or below the defined alarm limits, an alarm will be triggered. A triggered alarm will be indicated in the Derived Parameter Table by updating a data cell's background color updating to red. For example, if the frequency (f) derived parameter alarm was configured to Low: 170 and High: 200.</p> <div><div>Alarm Settings</div><table><tr><th>Parameter</th><th>Unit</th><th>Enable</th><th>Lower Limit</th><th>Upper Limit</th></tr><tr><td>WBP</td><td></td><td></td><td></td><td></td></tr><tr><td>f</td><td>BPM</td><td><input checked="" type="checkbox"/></td><td>170</td><td>200</td></tr><tr><td>TVb</td><td>ml</td><td><input type="checkbox"/></td><td>0</td><td>0</td></tr><tr><td>MVb</td><td>ml/min</td><td><input type="checkbox"/></td><td>0</td><td>0</td></tr><tr><td>Penh</td><td></td><td><input type="checkbox"/></td><td>0</td><td>0</td></tr><tr><td>PAU</td><td></td><td><input type="checkbox"/></td><td>0</td><td>0</td></tr><tr><td>Roef</td><td></td><td><input type="checkbox"/></td><td>0</td><td>0</td></tr></table></div> <p>This resulted in the following updates to the Derived Parameter Table to indicate these logged times met the alarm condition:</p>	Parameter	Unit	Enable	Lower Limit	Upper Limit	WBP					f	BPM	<input checked="" type="checkbox"/>	170	200	TVb	ml	<input type="checkbox"/>	0	0	MVb	ml/min	<input type="checkbox"/>	0	0	Penh		<input type="checkbox"/>	0	0	PAU		<input type="checkbox"/>	0	0	Roef		<input type="checkbox"/>	0	0
Parameter	Unit	Enable	Lower Limit	Upper Limit																																						
WBP																																										
f	BPM	<input checked="" type="checkbox"/>	170	200																																						
TVb	ml	<input type="checkbox"/>	0	0																																						
MVb	ml/min	<input type="checkbox"/>	0	0																																						
Penh		<input type="checkbox"/>	0	0																																						
PAU		<input type="checkbox"/>	0	0																																						
Roef		<input type="checkbox"/>	0	0																																						

			
<b>Context Bar</b>			
		Undo	If a measurement or recording period has been changed, added, or deleted, this button will undo the operation.
		Redo	If you clicked the Undo button, you can “undo the undo” by clicking this button.
		Ventilator Settings	If acquiring data live with apparatus which is controlling a ventilator, this button allows you to change the ventilator settings. In review it is always disabled.
		Copy to clipboard	Depending on where the cursor is, this provides a menu of commands to copy data to the clipboard. You may be able to copy data from the signal chart, or the trend chart, or the table, or you can copy an image of the page, or an image of either chart.
		Modify Measurement	If a measurement is selected (the measurement tool of either the signal chart or the trend chart must enable adjustments of measurements), this button presents a form which allows you to modify the baseline make-up of the measurement.
		Add/Delete Baseline	If measurements are in an editable state and then a measurement is selected, you can add or delete a baseline associated with that measurement by clicking these buttons.
		Delete Recording period	In FinePointe Station, recording periods determine which data is save in FinePointe. If during data acquisition you have selected a recording period, you can delete it with this button. Deleting a recording period will cause FinePointe to remove the data within it and not save it in the study database. In review, this button does nothing. Note: Measurements must be in an editable state (pencil icon) to see this option.
		New/Paste Event	If a chart (either signal chart or trend chart) is selected, you can add a manual event at the cursor position by clicking the <b>New Event</b> button or by clicking the <b>Paste Event</b> button.
			
		Zoom	When the Trend chart is selected, these buttons will zoom the chart to the selected time width.
			

	Zoom	When the Signal chart is selected, these buttons will zoom the chart to the selected time width.
		This button places the view in a special mode that keeps all trend chart, signal chart, and table synchronized to the same data.
	View Status Message History	<p>This button will open a dialog containing a list of rejected breaths, the time these breaths occurred, and the reason they were rejected. The information in this dialog may be copied and pasted into another document to permit finding the breath in the historical signal chart and table area.</p> 

## HISTORICAL SIGNAL CHARTS

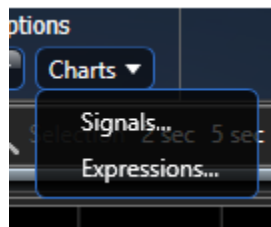
The Historical Signal Charts preset the waveforms acquired. You can collapse this area so that more display space can be used for the Trend Charts and the Table Area by clicking the – button in the upper right corner.



**Figure 104.** The collapse button you can click to collapse the Historical Signal Charts.

## SIGNAL SETUP

Configure the content of these charts by pulling down the **Charts** button on the command bar and selecting **Signals...**



**Signals** presents a form that allows users to configure the *Historical Signal Charts*.

Color	Name	Graph	Manual	Auto Scale	Auto Offset	Settings
	Box Flow	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Auto Scale
	Volume	<input type="checkbox"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Auto Scale
	Tchamber	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Range: <input type="text" value="2"/>
	Hchamber	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Range: <input type="text" value="4"/>
	Tbody	<input type="checkbox"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Auto Scale
	BiasFlow	<input type="checkbox"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Auto Scale
	Conditioned Box	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Auto Scale

**Save**

**Figure 105.** This form permits changes to how signals are displayed in the Historical Signal Charts and how the graphs are scaled.

Place a check by each signal to display in the Historical Signal Charts.

The columns to the right of the check boxes allow users to specify how the Y-axis is scaled. Choose **Manual** if you want to specify the extents of the Y axis. Choose **Auto Scale** to scale the Y axis to the data being plotted. Choose **Auto Offset** to specify a range and have the offset be adjusted according to the data.

To set the color, choose a color from the Color column.

Click **Save** when finished.

In Figure 102 there is a yellow box drawn around a small menu in the upper left corner of the Historical Signal Charts. This menu allows users to control the Y-Axis scaling and the display of measurements on the signals.



Historical Chart Options ▾

Y-Axis Scaler Offset Traces Measurements Selection Details ▾




**Y-Axis Scaler** is a toggle button which enables manual Y-axis scaling.


Toggle	Description
	Enable manual scaling on the Y-Axis. In this mode, users can drag the mouse along the Y-axis up or down to adjust the range.
	Lock scaling. In this mode, dragging the mouse up or down on the Y-axis does not adjust the range.

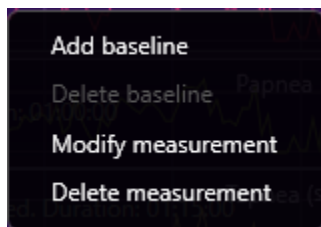
**Offset Traces** is a toggle button which enables you to view or manually adjust the vertical placement of the trace on the plot.

Toggle	Description
 Offset Traces	Enable manual scaling trace adjustment. In this mode, users can drag the trace with the mouse up or down.
 Offset Traces	Lock trace offset. In this mode, dragging the mouse up or down on the trace does not adjust the vertical position.

**Measurements** is a three-way toggle button which controls the measurement interval presentation.

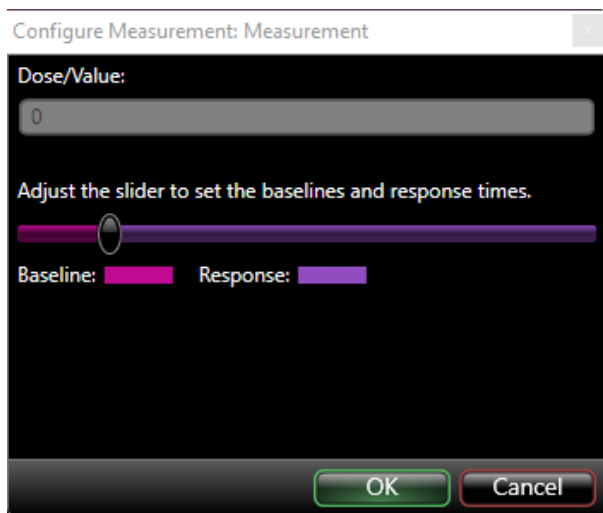
Toggle	Description
 Measurements	Enable adjustment of measurements. In this mode, users can drag the edges of a measurement to change the width or drag the body to change the position. Also, each measurement has a context menu which can be accessed by right-clicking on the measurement.
 Measurements	Measurements are visible but locked. In this mode, users cannot adjust the size or position of a measurement.
 Measurements	Hide the measurements.

When the Measurement toggle is in the  position, users can right-click on a measurement to see a context menu of operations you can perform:



**Add baseline** adds a baseline to a measurement. Users might do this if evaluating multiple responses in a protocol, and each response is measured relative to a baseline taken immediately before the response. In this case, when the measurement is summarized in a report, an expression may be created to find the difference from the baseline using the **baseline** function. The **baseline** computes the average of this baseline interval defined here. For example, users can create a report of “**PenH.Max - PenH.baseline**”. The report processing will find the maximum of the measurement interval (not including the baseline of the measurement) and subtract the average of the baseline interval of the measurement.

Once a baseline is added, the portion of the measurement which the baseline occupies may be adjusted. Alternatively, users can select **Modify measurement** to adjust the baseline portion from an edit form.



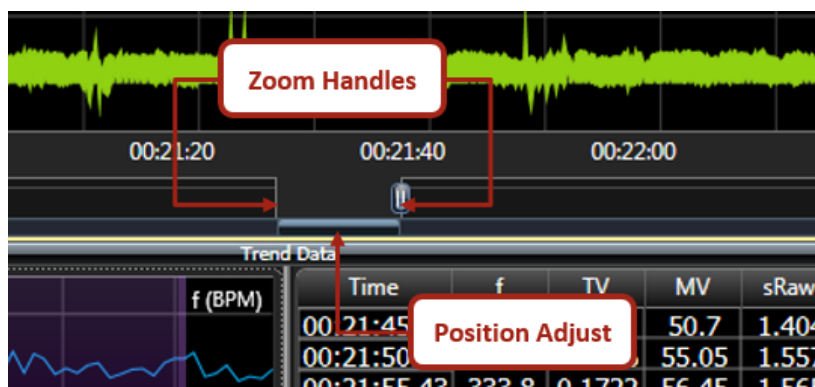
**Figure 106. Modify Measurement form.**

Move the slider to adjust the relative portion of the measurement divided into measurement and baseline.

The **Delete measurement** menu selection removes the measurement from that recording.

## SIGNAL NAVIGATION

The scroll bar of the Historical Signal Charts permits adjustments to the position within the recording, as well as the zoom of the charts. Figure 107 illustrates how it works. Expanding the Zoom Handles will increase the amount of sampled signal data displayed in the Historical Signal Charts (zoom out), while compressing them will reduce the amount of data displayed (zoom in).



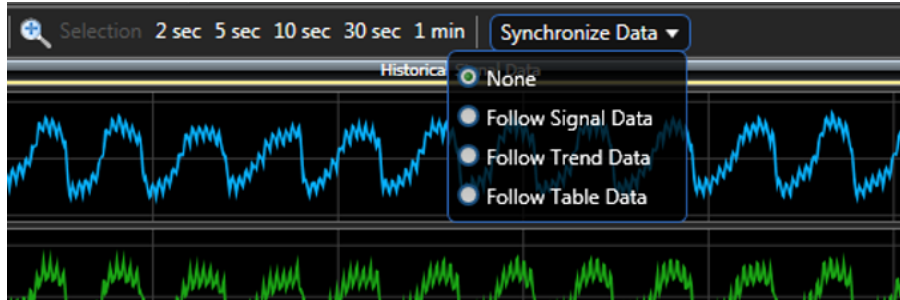
**Figure 107. This shows the scroll bar of the Historical Signal Charts.**

The Command Bar's "Zoom to" options provide a quick method to display exactly 2 seconds, 5 seconds, 10 seconds, 30 seconds, or 1 minute of data in the chart.

**Note:** The chart area selected (e.g. Historical Signals or Trend) will be the chart on which these "Zoom to" selections will operate.



The **Synchronize Data** button available from the Command Bar will automatically update the data position of the Chart/Table based on the selection. By default, **None** is selected. This means each Chart and Table can be positioned to various locations (time points) throughout the data, independently.



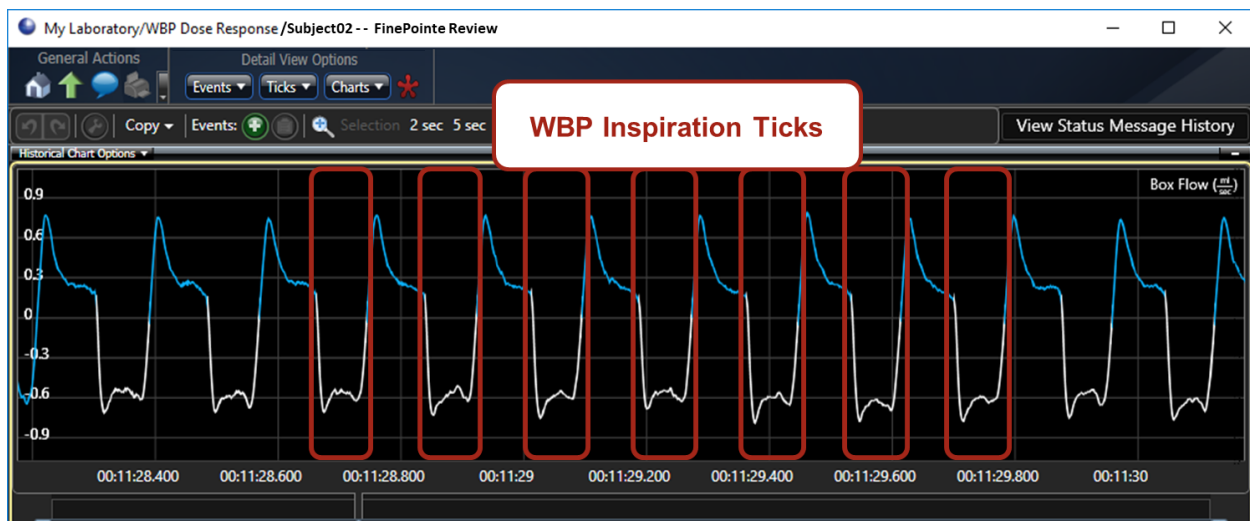
**Figure 108.** This shows the available *Synchronize Data* options.

Other options include:

- **Follow Signal Data** will automatically reposition the Trend Charts and Table Area based on the cursor position of the Historical Signal Charts.
- **Follow Trend Data** will automatically reposition the Historical Signal Charts and Table Area based on the cursor position of the Trend Charts.
- **Follow Table Data** will automatically reposition the Historical Signal and Trend Charts based on the displayed section of the Table Area.

## DISPLAY TICKS

Algorithm **Ticks** may also be displayed on the *Historical Signal Charts*. Ticks provide context to how the algorithm marked the various points of interest on the signal. In Figure 109, the WBP Inspiration Ticks are enabled and displayed as a highlighted section of data. This highlighted section represents the inspiration section of the signal marked by the WBP algorithm. Similar marks are available for the entire breath, expiration, peak inspiratory flow (PIF), peak expiratory flow (PEF), and the expiratory flow at 50% tidal volume (EF50).



**Figure 109.** Illustrates the *WBP Inspiration Ticks* enabled on the *Historical Signal Charts*.

## DISPLAY EVENTS

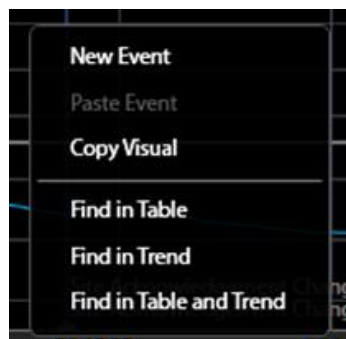
The **Events** button allows users to select the classes of events you want to annotate on each plot. By default, none are selected. The events provide important clues about specific actions that took place during data collection. Since FinePointe walks through the data collection procedure, it records the precise time when actions were performed.

Event	Description
<b>System</b>	Displays instances of system level events chronologically on the plot; e.g. site acknowledgement changes.
<b>Manual</b>	Displays instances of manually placed events chronologically on the plot; e.g. events entered using the Events button in the Command Bar or via right-click from the Historical Signal Charts.
<b>Task Sequence</b>	Displays task sequence events chronologically on the plot; e.g. nebulizing PBS.
<b>Task Action</b>	Displays task action events chronologically on the plot; e.g. nebulizer on: 0.02 ml for 30 seconds.
<b>Antagonist</b>	Displays antagonist events chronologically on the plot. Only used with Antagonist study type.
<b>Time Zero</b>	Displays the Time Zero marker on the plot.
<b>Security</b>	Displays any GLP security events that occurred throughout the acquisition.

**Note:** Enabled Events will be displayed in the *Historical Signal Charts* and the *Trend Charts*.

## RIGHT-CLICK OPTIONS

The following outlines the right-click options available from the *Historical Signal Charts*:

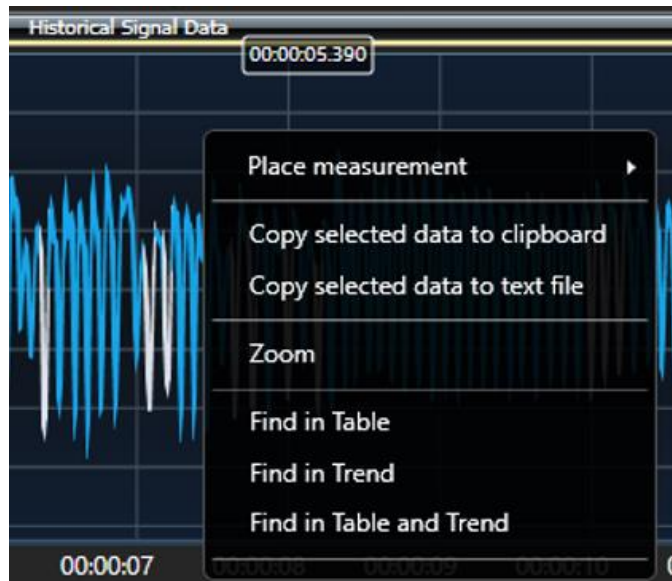


**Figure 110.** Displays the right-click menu of the *Historical Signal Charts*.

- **New Event** permits a comment to be entered that is stored as an event with a **Manual** class.
- **Paste Event** permits an event to be pasted that was previously copied.
- **Copy Visual** copies an image of the plot to the clipboard. This permits pasting the plot into a third party application; e.g. Microsoft PowerPoint.
- **Find in Table** synchronizes the Table Area with the Historic Signal Charts, highlighting the row of parameter data in which the respiratory cycle associated with the cursor placement is contained.
- **Find in Trend** synchronizes the Trend Charts with the Historic Signal Charts, placing the cursor at the equivalent time in the Trend Chart.

- **Find in Table and Trend** synchronizes the Table Area and Trend Chart with the cursor position from the *Historic Signal Charts*.

The following will outline the right-click options available from a selected area (click-and-drag) within the *Historical Signal Charts*:



**Figure 111.** Displays the right-click menu options of a selected section of data from the *Historical Signal Charts*.

- **Place measurement** allows users to retroactively place measurements. Manual measurement placement is typically used when running a Pilot study.
- **Copy selected data to clipboard** copies the sampled signal data to the clipboard to paste into a third-party application; e.g. Microsoft Excel.
- **Copy select data to text file** creates a text file (.txt) containing the sampled signal data. If selected, a Windows Explorer Save As dialog is presented.
- **Zoom** expands the time axis (x-axis) to permit closer examination of the signal data in more detail.
- **Find in Table** synchronizes the *Table Area* with the *Historic Signal Charts*, highlighting the row(s) of parameter data in which the respiratory cycles associated with the selected signal data is contained.
- **Find in Trend** synchronizes the *Trend Charts* with the *Historic Signal Charts*, highlighting a selection of trend data equivalent in duration and placement as that selected in the *Historical Signals Charts*.
- **Find in Table and Trend** synchronizes the *Table Area* and *Trend Chart* with the data selection from the *Historic Signal Charts*.

## TREND CHARTS

The *Trend Charts* display plots of the *Table Area* columns.

## TREND SETUP

Configure the content of these charts by selecting **Expressions...** from the **Charts** button in the **Command Bar**.



**Figure 112.** The *Expression Options* form used to configure the *Trend Charts*.

Place a check in the **Graph** column to choose which parameters are displayed in the *Trend Charts* area. The columns to the right of the checkbox control how the Y axis is scaled. Choose **Manual** if you want to specify the Y axis limits. Choose **Auto Scale** to have the Y axis automatically adjusted to fit the content. And if you choose **Auto Scale**, you can optionally choose **Zero Based** too. While **Auto Scale** alone adjusts both the maximum and the minimum of the Y axis to fit the data, **Zero Based** chooses one axis limit to be zero. If the data is positive, then the minimum Y axis limit will be zero. If the data is negative, then the maximum Y axis limit will be zero.

**Note:** please see the **Derived Parameters** section in the **Appendix** of this manual for details on each parameter.

To set the color, choose a color from the *Color* column.

Click **Save** when done.

In Figure 102 there is a yellow box drawn around a small menu in the upper left corner of the Trend Charts. This menu allows users to control the Y-Axis scaling and the display of measurements on the signals.



**Y-Axis Scaler** is a toggle button which enables manual Y-axis scaling.

Toggle	Description
	Enable manual scaling on the Y-Axis. In this mode, users can drag the mouse along the Y-axis up or down to adjust the range.
	Lock scaling. In this mode, dragging the mouse up or down on the Y-axis does not adjust the range.

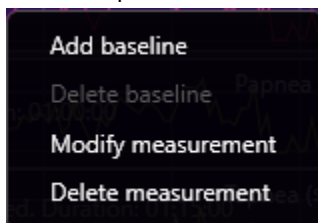
**Offset Traces** is a toggle button which enables users to view or manually adjust the vertical placement of the trace on the plot.

Toggle	Description
	Enable manual scaling trace adjustment. In this mode, users can drag the trace with the mouse up or down.
	Lock trace offset. In this mode, dragging the mouse up or down on the trace does not adjust the vertical position.

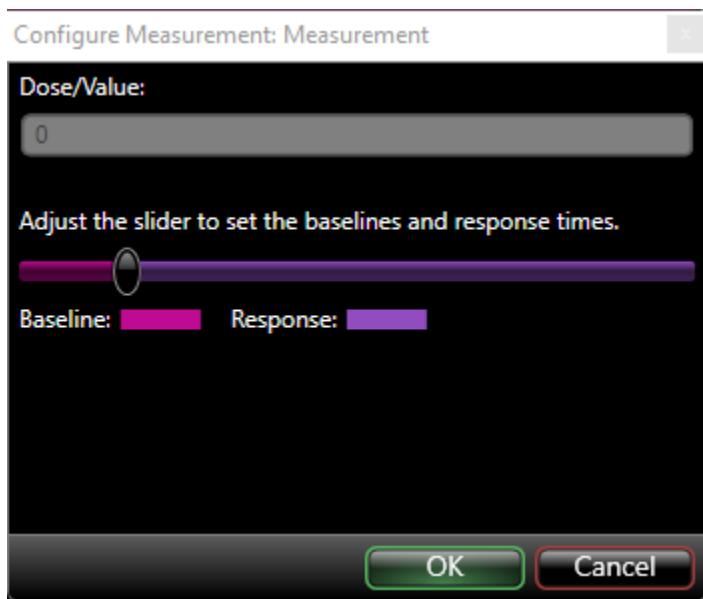
**Measurements** is a three-way toggle button which controls the measurement interval presentation.

Toggle	Description
	Enable adjustment of measurements. In this mode, users can drag the edges of a measurement to change the width or drag the body to change the position. Also, each measurement has a context menu which may be accessed by right-clicking on the measurement.
	Measurements are visible but locked. In this mode, users cannot adjust the size or position of a measurement.
	Hide the measurements.

When the Measurement toggle is in the position, right-click on a measurement to see a context menu of operations:



**Add baseline** adds a baseline to a measurement. Once a baseline is added, you can adjust the portion of the measurement which the baseline occupies. Alternatively, users can select **Modify measurement** to adjust the baseline portion from an edit form.



**Figure 113. Modify Measurement form.**

Move the slider to adjust the relative portion of the measurement divided into measurement and baseline.

The **Delete measurement** menu selection removes the measurement from that recording.

## TREND NAVIGATION

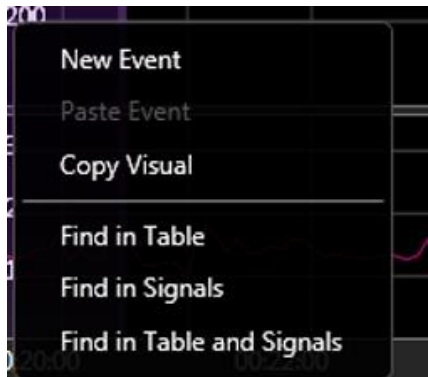
The scroll bar of the trend charts permits adjustments to be made to both the position within the recording and the zoom of the charts. Figure 114 illustrates how it works.



**Figure 114. This shows the scroll bar of the trend charts.**

## RIGHT-CLICK OPTIONS

The following outlines the right-click options available from the *Trend Charts*:



**Figure 115.** Displays the right-click menu of the Trend Charts.

- **New Event** permits a comment to be entered that is stored as an event with a **Manual** class.
- **Paste Event** permits a previously copied event to be pasted.
- **Copy Visual** copies an image of the plot to the clipboard. This permits pasting the plot into a third party application; e.g. Microsoft PowerPoint.
- **Find in Table** synchronizes the *Table Area* with the *Trend Charts*, highlighting the row of parameter data in which the respiratory cycle associated with the cursor placement is contained.
- **Find in Signals** synchronizes the *Trend Charts* with the *Historic Signal Charts*, placing the cursor at the equivalent time in the *Historical Signal Charts*.
- **Find in Table and Signals** synchronizes the *Table Area* and *Historical Signal Charts* with the cursor position from the *Trend Charts*.



**Figure 116.** Displays the right-click menu options of a selected section of data from the Trend Charts.

- **Place measurement** allows users to retroactively place measurements. Manual measurement placement is typically used when running a Pilot study.
- **Copy selected data** copies the parameter trend data to the clipboard to paste into a third-party application; e.g. Microsoft Excel.
- **Zoom** expands the time axis (x-axis) to permit closer examination of the trend data in more detail.
- **Find in Table** synchronizes the *Table Area* with the *Historic Signal Charts*, highlighting the row(s) of parameter data in which the respiratory cycles associated with the selected signal data is contained.

- **Find in Signals** synchronizes the *Trend Charts* with the *Historic Signal Charts*, highlighting a selection of *Historical Signal Chart* data equivalent in duration and placement as that selected in the *Trend Charts*.
- **Find in Table and Signals** synchronizes the *Table Area* and *Historical Signal Charts* with the data selection from the *Trend Charts*.

## TABLE AREA

The table area is where the analyzer tables display derived parameter data. All parameters which the WBP and Apnea analyzer can calculate are displayed in this table. The table area shows one table at a time. Select which table to view by clicking on the respective tab in the lower left corner of the table.

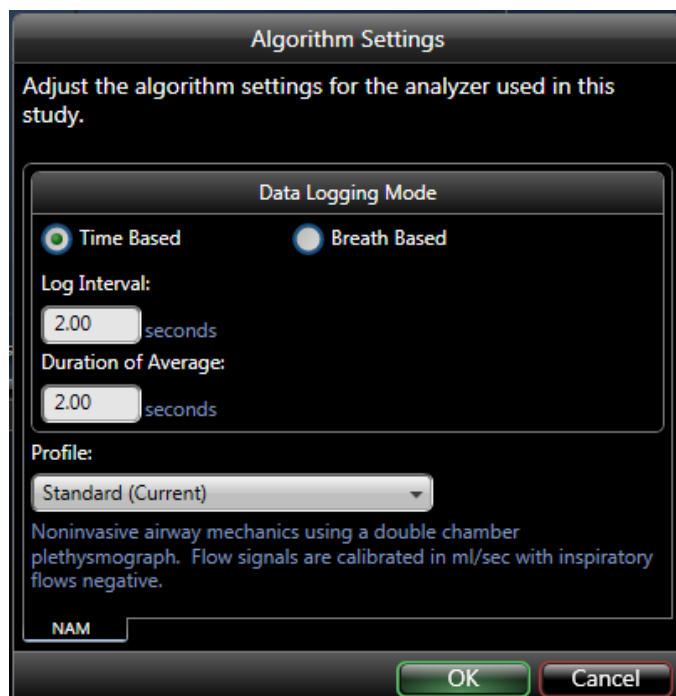


The screenshot shows a software interface with a table of data on the right and a selection tab at the bottom left. The table has five columns and five rows of data. The selection tab at the bottom left has two options: 'WBPth' (selected) and 'Apnea'.

01:14:59.47	254.1	0.2834	0	72.0
01:14:59.60	481	0.3196	0	153.
01:14:59.70	616.3	0.2841	0	175.
01:14:59.81	542.8	0.3733	0	202.
01:14:59.95	424.2	0.2909	0	123.

**Figure 117.** This image shows the table selection tab in the lower left of the table area. Shown here, **WBPth** is selected.

By default, data is logged to the table in 2 second averages. The Data Logging Mode may be changed to a different, user defined setting within the Acquisition Algorithm Settings. The Acquisition Algorithm Settings are accessible from the Study Page Command Bar, under the Study Settings. See **Command Bar** section for icon.



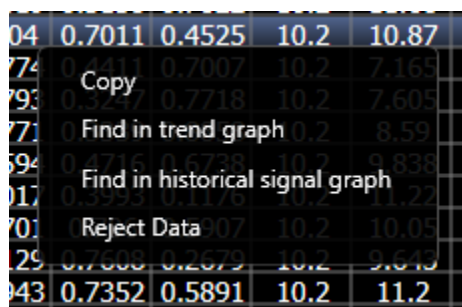
**Figure 118.** An example Algorithm Settings dialog with default Logging Interval set to 2 Seconds.



Choose between a time based or a breath-based logging mode. Once the method is chosen, define the new Log Interval and Duration of Average. If an average data point every logged line is desired, ensure the Log Interval and Duration of Average are equal. However, if a moving average is preferred, then set the Log Interval to be smaller than the Duration of Average. For example, a 10 second moving average (Duration of Average) logged every 2 seconds (Log Interval).

**Note:** If data has already been collected, it must reanalyze with the updated Data Logging Mode defined.

Select one or more rows from the table and right-click on the selected rows to see a context menu.



**Figure 119.** The context menu presented when you right click on the table.

- **Copy** copies the selected rows to the clipboard. Copied rows may be pasted into Excel or Word.
- **Find in trend graph** positions the cursor in the trend graph to that row.
- **Find in historical signal graph** positions the signal cursor to the time at end of that row.
- **Reject Data** rejects that single row from reporting.

Also, if the mouse is hovered over a column heading, a tooltip will display the units of the data for that column.



**Figure 120.** The column header tooltip displaying units of MVb.

Click the column header to sort highest to lowest or lowest to highest. To sort chronologically, click the Time header.

## MAINTENANCE

As you use your FinePointe WBP system, some parts will wear out and may need to be replaced. Proper care and maintenance will help ensure consistent results and that your equipment investment will last for years.

Consider replacing/servicing the following components on a scheduled basis:

- Tubing
- Pneumotach Screens
- O-rings
- Nebulizers

The frequency of replacement will depend on a variety of factors that may include: testing environment, frequency of use, aerosol exposure, and proper care of equipment throughout. Good Laboratory Practices (GLP) and routine equipment maintenance/servicing are recommended. At a minimum, tubing and screens should be replaced annually.

Maintenance kits are available for the different WBP Chambers. This section will provide an outline of the various kits, their part numbers, and what's contained in each.

Maintenance Kit	Part Number	Contents
<b>Basic Chamber Accessory Tool Kit</b>	601-2524-064	Provides the necessary tools required for routine maintenance
<b>Large LA WBP Chamber Maintenance Kit</b>	011424-001	Replacement O-rings, pneumotach screens, screws for the door latches, replacement foam for door seal, necessary hex screw driver, and pneumotach plug. Also includes 60 cc syringe, Luer fitting, and tubing for calibration.
<b>Medium LA WBP Chamber Maintenance Kit</b>	601-5514-001	Replacement O-rings, pneumotach screens, screws for the door latches, replacement foam for door seal, necessary hex screw driver, and pneumotach plug. Also includes 60 cc syringe, Luer fitting, and tubing for calibration.
<b>NHP WBP Chamber Maintenance Kit</b>	601-5510-001	Replacement O-rings, pneumotach screens, screws for the door latches and circular opening, and replacement foam for door seal.
<b>Rabbit/Ferret WBP Maintenance Kit</b>	601-2514-017	Replacement O-rings, pneumotach screens.

Please see the [Buxco Bias Flow Manual](#) for the appropriate maintenance information.

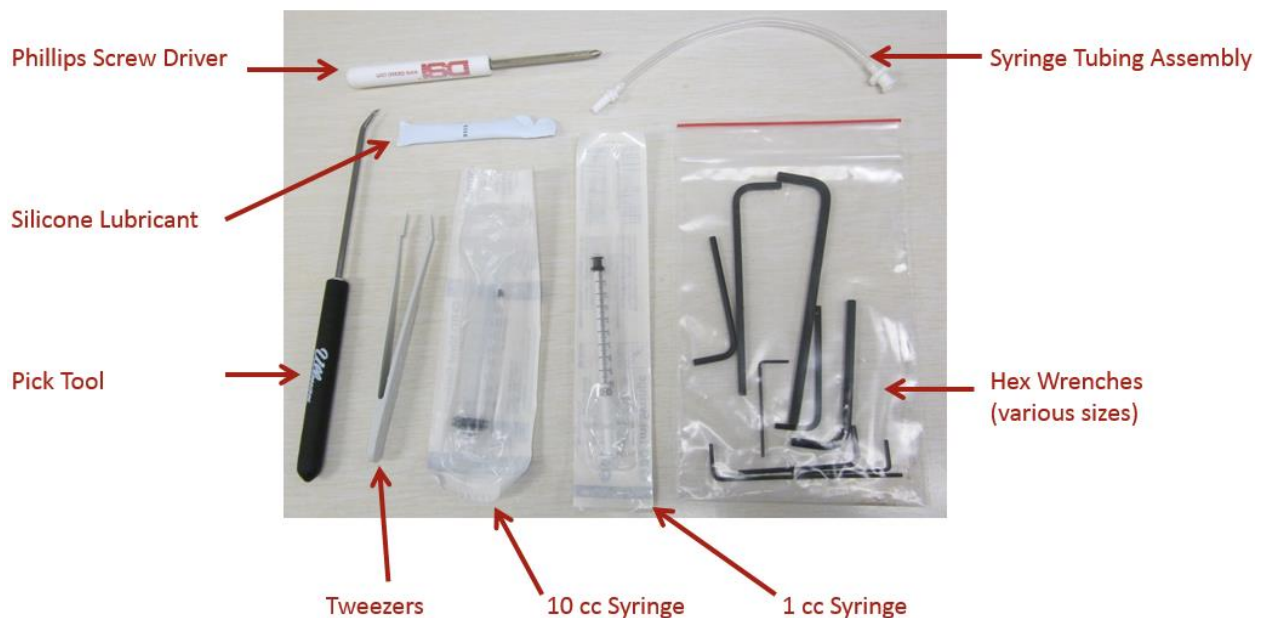
## BASIC CHAMBER ACCESSORY TOOL KIT

The Basic Chamber Accessory Tool Kit provides the necessary tools required for routine maintenance.

- Replacement part number: 601-2524-064

The tool kit consists of the following items:

- Phillips Screw Driver      Provided for general purpose use.
- Silicone Lubricant      Use to lubricate chamber and restraint O-rings.  
  
**DO NOT** use on pneumotach O-rings, as the lubricant can clog the screens and alter resistance properties.
- Pick Tool      Use to help remove O-rings.
- Tweezers      Use to handle pneumotach screens during replacement process.  
  
**DO NOT** use ungloved fingers to handle new pneumotach screens, as skin oils can clog screens and alter resistance properties.
- Syringes (1cc, 10cc)      Use to push/pull air into the chamber for system testing.
- Syringe Tubing Assembly      Use to connect syringe to chamber.
- Hex Wrenches      Use to remove pneumotachograph cover to access screens and to remove nose cap screws for nose cap seal replacement.



**Figure 121. Basic Chamber Accessory Tool Kit with indicators.**

## FILTERS AND IN-LINE DRYER TUBES

The filters and in-line dryer tube silica gel used will need to be replaced with extended use:

1. **TSI HEPA Filter** The TSI HEPA filter helps protect the bias flow's internal components from any dust or dander coming back into the system through the outflow tubing. The main indicator for replacement is when the bias flow is having difficulty regulating the flow.

**Replacement part: 601-3149-001**

*Note:* this part is the TSI Airflow Filter Kit, which also contains the Whatman HEPA-VENT filter and tube fittings for the TSI HEPA filter.

2. **Silica gel** The in-line dryer tubes are filled with silica gel beads used to remove moisture from the air flow. The silica gel beads used in the cylinders are originally blue in color. When the beads turn pink, they must be replaced or dried.

**Replacement part number: 601-3176-001    Silica Gel Beads (5 lbs)**

3. **In-line Dryer Tubes** The In-line Dryer tubes are reusable. However, replacement tubes are needed, the following parts may be ordered.

**Replacement part numbers:**

- **601-3175-001    In-line Dryer Tube Kit** comes with 2 dryer tubes and associated fittings/tubing, 5lbs jar of Silica gel beads, and dryer tube stands.
- **012448-001    In-line Dryer Tube (Qty: 1)**
- **012526-001    In-line Dryer Tube stand bracket (Qty: 1, two are necessary to hold dryer)**

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## REUSING THE IN-LINE DRYER TUBE SILICA GEL BEADS

The In-line Dryer tube uses reusable Silica gel beads that change color to indicate the level of moisture drawn out of the inflow air. As the beads become saturated, they will change from blue to pink. Another indication that the beads need to be dried or changed is when the inflow humidity begins to climb higher than expected or cannot be maintained. Once this occurs, the beads must be removed to go through the drying process.

To remove the Silica gel beads from the in-line dryer tubes:

1. Disconnect any tubing connected to the in-line dryer tubes' end caps.

2. Rotate the end cap counter clockwise to release the pin.



3. Pull end cap out.
4. Pour Silica gel beads out of dryer tube.
5. Add new Silica gel beads into dryer tube.
6. Replace end cap.
7. Rotate end cap clockwise to lock pin in place.

#### **DRYING PROCESS:**

To reuse the silica gel, set an oven to 255°F, ~120° C, pour the silica gel beads into a flat pan, and heat until the beads turn blue again (~12 hours). When they are completely cooled down, they may be reused with the in-line dryer.

#### **PNEUMOTACH SCREENS**

This section details the process used to replace pneumotach screens. These fine mesh screens, mounted in the plexiglass pneumotachographs on the side of the animal chamber, provide the stable resistance elements necessary to accurately monitor the breathing waveform of the animal. The resistance element is part of the transducer/preamplifier circuit that, when calibrated, provide a waveform that the software analyzes during the course of the experiment. When these screens become contaminated due to environmental dust and ordinary usage over an extended period, the resistance provided by the screens will change. As the resistance of the screens changes, the effective range obtained during calibration will change. When the effective range begins to shrink, this is a good indication that the pneumotach screens are dirty and should be replaced.

---

#### **SCREEN REPLACEMENT**

To replace the pneumotach screens:

1. Use a hex wrench to remove the four stainless steel screws that hold the pneumotachograph cover in place.



**IMPORTANT!!** Note the number of screens removed from each side as the identical number of new screens will need to be inserted. Under most circumstances:

- Large Animal Chamber
  - 4 screens associated with the animal chamber.
  - 12 screens associated with the reference chamber.
- Medium Chamber
  - 2 screens associated with the animal chamber.
  - 8 screens associated with the reference chamber.
- Rabbit/Ferret
  - 3 screens associated with the animal chamber.
  - 10 screens associated with the reference chamber.
- NHP
  - 5 screens associated with the animal chamber.
  - 10 screens associated with the reference chamber.

However, if DSI has recommended a different number of screens be used, be sure to replace appropriately. Be careful not to crimp or bend the screens.

2. Remove the cover and then remove the screens. Note the number of screens removed. In normal use, only the screens attached to the animal side need to be replaced.
3. If necessary, remove and replace pneumotach O-rings.
4. Insert the identical number of new screens that were removed.
5. Replace the pneumotach covering and screw it back into place.

Replacement part numbers:

- 011382-001 (Large – quantity 1)
- 008902-001 (Medium – quantity 1)
- 008901-001 (NHP – quantity 1)
- 601-2524-059 (Rabbit/Ferret – quantity 20)

*Please see the appropriate kits that include larger quantities of screens.*

## O-RINGS

O-rings provide a seal between two removable components. O-rings should be free from cracks, debris, and excessive wear.

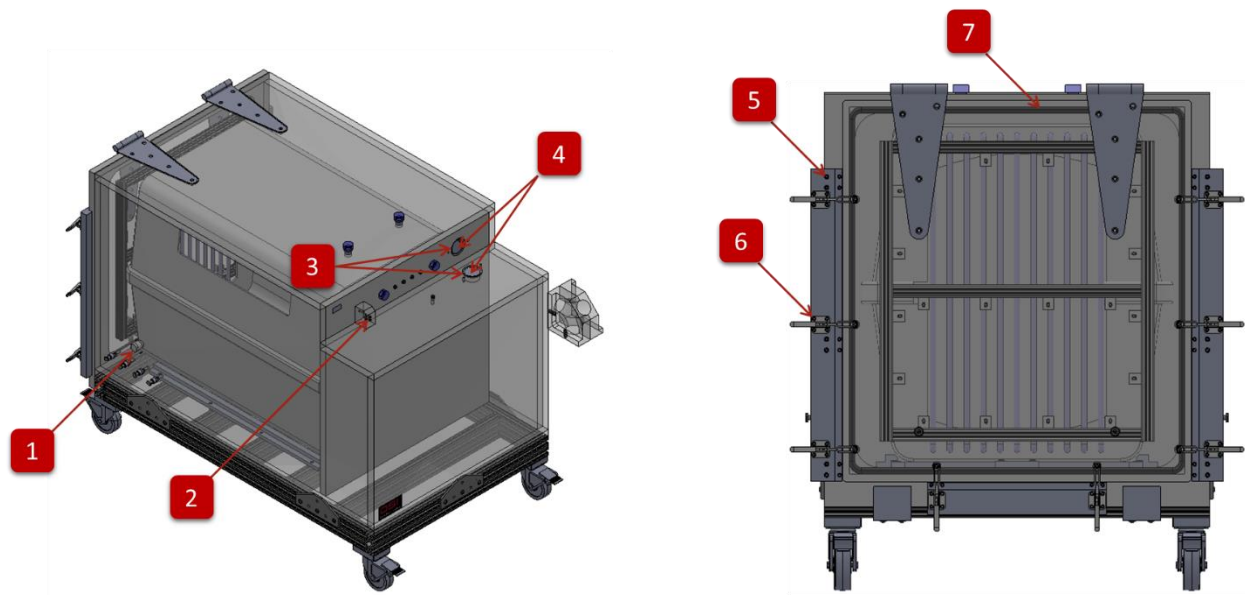
Replacement O-rings can be found in the maintenance kits for the particular chamber being used.

Silicone Lubricant (part number: 601-2524-052) should be used on O-rings which create seals with moving components. This will reduce the amount of friction between the O-ring and moving part and extend the life of the O-ring and make it easier to connect/disconnect the component.

## LARGE LA WBP CHAMBER MAINTENANCE KIT

The following outlines the components available in the kit.

Replacement Kit Part Number: **011424-001**

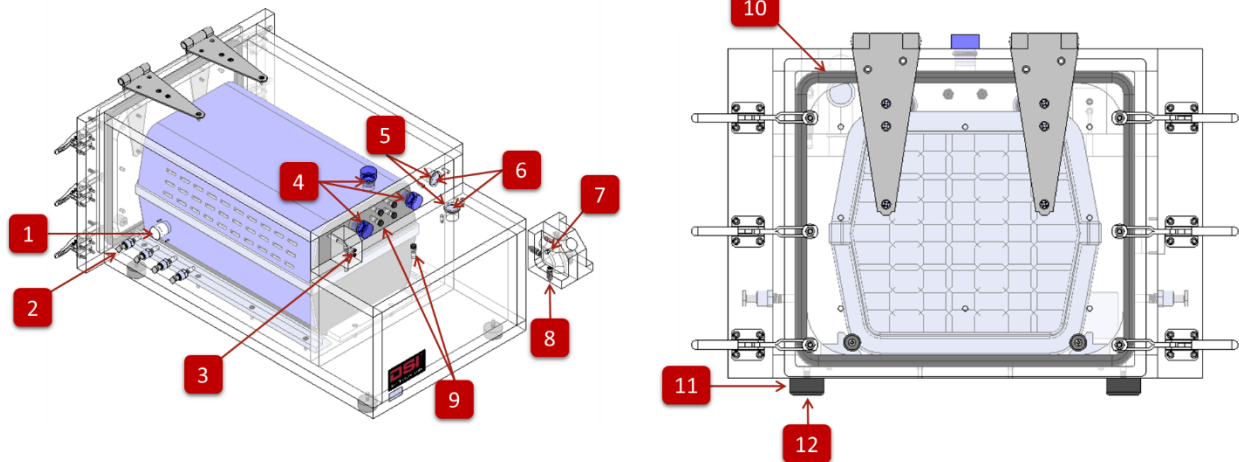


Find Number	Description	Quantity	DSI Part Number
1	Rubber Plug, 1-3/32"	1	011487-001
2	O-ring, #008	2	009459-001
3	O-ring, #228	2	011421-001
4	Pneumotach Screens	16	011382-001
5	Screw, 10-24 x 1/2"	4	905559-001
6	Screw, 10-24 x 3/8"	4	007354-001
7	Rubber Seal, 1/2"	10 feet	011363-001
Not Pictured	Pneumotach Plug	1	011422-001
Not Pictured	Syringe, 60 cc	1	010087-001
Not Pictured	Luer Fitting, FTLL240-1	1	008649-001
Not Pictured	Tubing, Clear, 3/16" x 5/16"	2 feet	010179-001
Not Pictured	Hex Wrench, 5/32" Short Art	1	011216-001

## MEDIUM LA WBP CHAMBER MAINTENANCE KIT

The following outlines the components available in the kit.

Replacement Kit Part Number: **601-5514-001**



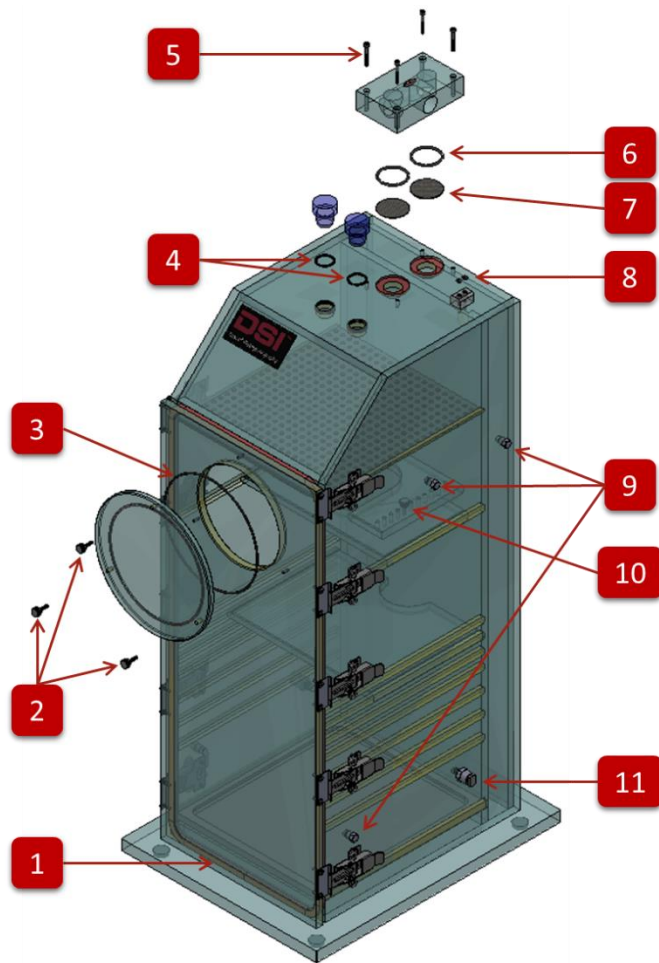
Find Number	Description	Quantity	DSI Part Number
1	Rubber Plug, 1-3/32"	1	011487-001
2	Push-to-Connect Plug, 5/16"	8	007166-001
3	O-ring, #008	2	009459-001
4	O-ring, #118	3	009443-001
5	O-ring, #214	2	012060-001
6	Pneumotach Screens	10	008902-001
7	Luer Fitting, 1/4-28, White	1	601-2524-051
8	Screw, 1/4-28 x 1"	4	905592-001
9	Fitting, Black Plug, 1/8-27	5	008771-001
11	Rubber Seal, 1/2"	5 feet	011363-001
12	Rubber Feet	4	009147-001
Not Pictured	Screw, 1/4-28 x 3/4" (attach rubber feet)	8	0905590-001
Not Pictured	Pneumotach Plug	1	012093-001
Not Pictured	Syringe, 60 cc	1	010087-001
Not Pictured	Tubing, Clear, 3/16" x 5/16"	2 feet	010179-001
Not Pictured	Screw, 1/4-28 x 3/4" (attach rubber feet)	8	0905590-001



## NHP WBP CHAMBER MAINTENANCE KIT

The following outlines the components available in the kit.

Replacement Kit Part Number: **601-5510-001**

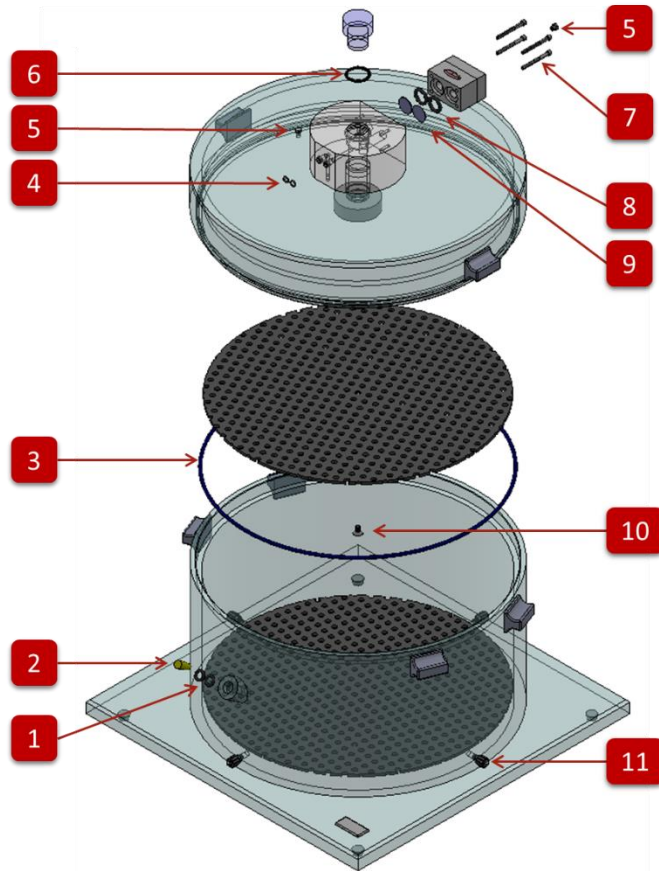


Find Number	Description	Quantity	DSI Part Number
1	Rubber Seal, 3/8"	7 feet	009651-001
2	Thumb Screw, 8-32 x 5/8"	3	905505-001
3	O-ring, #116	1	011524-001
4	O-ring, #118	2	009443-001
5	Screw, 8-32 x 1-1/2"	4	905602-001
6	O-ring, #222	2	009453-001
7	Pneumotach Screen	10	008901-001
8	O-ring, #008	2	009459-001
9	Fitting, Threaded Plug, 1/8-27 NPT	6	008770-001
10	Thumb Screw, 10-32 x 3/4"	2	011601-001
11	Push-to-Connect Plug, 5/16"	2	007166-001

## RABBIT/FERRET WBP MAINTENANCE KIT

The following outlines the components available in the kit.

Replacement Kit Part Number: **601-2514-017**



Find Number	Description	Quantity	DSI Part Number
1	O-ring, #109	3	008903-001
2	Silicone Plug	25	009262-001
3	O-ring, #279, Teflon Coated	1	009485-001
4	O-ring, #008	2	009459-001
5	Fitting, Threaded Plug, 10-32 UNF	Not included	008773-001
6	O-ring, #118	1	009443-001
7	Screw, 6-32 x 1-1/2"	Not included	009048-001
8	O-ring, #206	2	009456-001
9	Pneumotach Screen	12	008898-001
10	Screw, 10-32 x 3/8"	Not included	905663-001
11	Luer Fitting, Lock Ring, Black	Not included	601-2524-046
	Luer Fitting, Male Plug, White	Not included	601-2524-048
Not Pictured	Luer Fitting, Male Plug, White	4	008667-001

## CARE AND CLEANING

### CLEANING THE CHAMBER

Clean animal chamber of debris as needed by wiping with a cloth or rinsing with warm water. For a more thorough cleaning, use warm water and a mild dish detergent. It is best to let the chambers thoroughly air dry. Be certain that no water remains in any bias flow ports or tubing. If required, dry with a cloth towel.

- **DO NOT** submerge the chamber as this will affect pneumotach screens and the reference chamber.
- **DO NOT USE WINDEX** or window cleaner to clean the plethysmograph. Continued use of Windex will eventually crack the lucite material.
- **DO NOT** put the chamber in the dishwasher.
- **DO NOT** use alcohol-based cleansers.

### CLEANING THE NEBULIZER HEAD

Clean the nebulizing equipment after each use. To clean the nebulizer head, remove it from the plethysmograph or aerosol block and rinse it in warm, soapy water. Let it soak for a few minutes. It can be submerged.

- **DO NOT** use a high-pressure water stream; let it run gently into the device.
- **DO NOT** touch the metal membrane or attempt to brush it, as this may cause damage, but do rinse it from both the top and the bottom
- **DO NOT** clean the head with alcohol. Alcohol will damage the metal membrane. It is best to use soapy water for all general cleaning.
- **DO NOT** leave the head attached to the chamber overnight after use.

### CORRECT DRYING POSITION

To dry, shake off the excess water and wipe gently with a paper towel or Kimwipes®. Set the head on its **SIDE** in a dry place.



### INCORRECT DRYING POSITION

Do **NOT** stand the head up or place it in any in-line circuit while not in use. Trapped humidity may cause the metal membrane to discolor.



If stubborn proteins build up on the head, dissolve an Efferdent tablet in a glass of water. Filter the solution with a syringe filter. Nebulize for 10 minutes. Rinse thoroughly, pat gently with paper towels, and air dry.

If you have been using a pathogen and wish to decontaminate, disconnect the head from the power cord and autoclave it using the “flash” steam sterilization cycle, 134C for 4 minutes.

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## NEBULIZER REPLACEMENT

Although proper cleaning, drying, and storage will help extend the life of a nebulizer head, over time they will need to be replaced.

Replacement parts:

- 601-2306-001 (2.5 - 4 µm particle size)
- 601-2307-001 (4 – 6 µm particle size)
- 012220-001 (Aerogen Nebulizer 30 mL Funnel)

---

## CAUTIONS

- To ensure proper nebulization, maintain the nebulizer head in an upright position.
- To avoid mechanical or electrical damage, do not drop the nebulizer head or the control module.
- Do not use in the presence of devices generating high electromagnetic fields such as magnetic resonance imaging (MRI) equipment.
- Disconnect the nebulizer head from control module before cleaning.
- Do not immerse or autoclave the nebulizer control unit.
- Use only with components specified by Aerogen or DSI.
- Inspect all parts before use, and do not use if any parts are missing, cracked or damaged. In case of missing parts, malfunction or damage, contact your DSI representative.
- Do not use or store outside of specified environmental conditions.

## TECHNICAL SUPPORT

DSI™ is available to help you with your questions and concerns. Should you hit a road block or need some additional training, please feel free to contact us. We are happy to help!

### DSI TECHNICAL SUPPORT—NORTH AMERICA

Email: [Support@datasci.com](mailto:Support@datasci.com)

Toll-free in U.S. and Canada

Phone: 1-800-262-9687

Monday through Friday: 8 AM to 5 PM CST  
(except Holidays)

### DSI TECHNICAL SUPPORT—EUROPE

Email: [Europe-support@datasci.com](mailto:Europe-support@datasci.com)

Phone: +44 1359 259400

Monday through Friday: 8 AM to 5 PM CET

### DSI TECHNICAL SUPPORT—ALL OTHER COUNTRIES

Phone: +1-651-481-7400

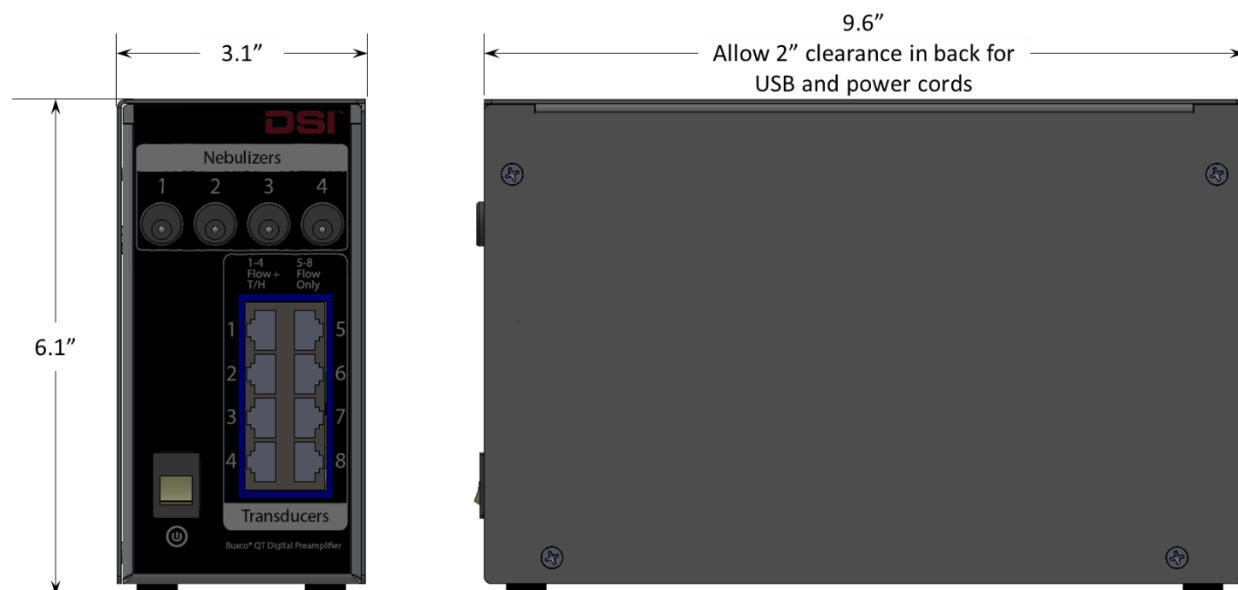
## APPENDIX

### QT DIGITAL PREAMPLIFIER DIMENSIONS AND POWER SPECIFICATIONS

Note: for bias flow dimensions and specifications, please see the [Buxco Bias Flow Manual](#).

#### QT DIGITAL PREAMPLIFIER (INCHES)

Part #: 601-1400-001



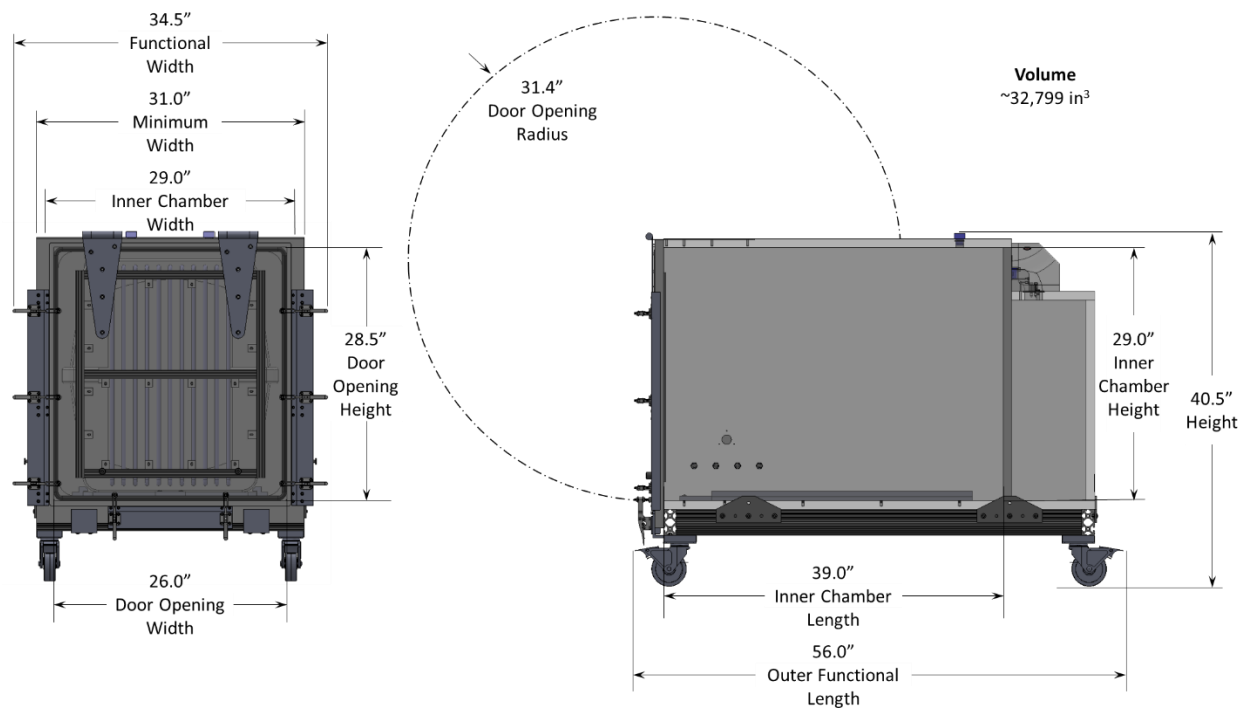
#### POWER ADAPTER SPECIFICATIONS

<b>Output</b>	DC Voltage	9V
	Rated Current	4.45A
	Rated Power (max)	40W
<b>Input</b>	Voltage Range	120-240 VAC
	Frequency Range	50/60 Hz
	AC Current (typical)	1.0 A

## CHAMBER DIMENSIONS

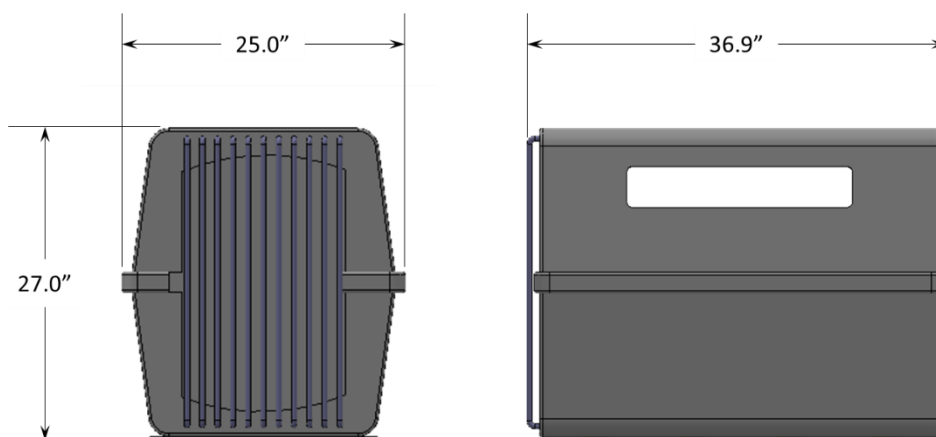
### LARGE, LARGE ANIMAL WBP EXAMPLE CHAMBER (INCHES)

Part # 601-1433-001



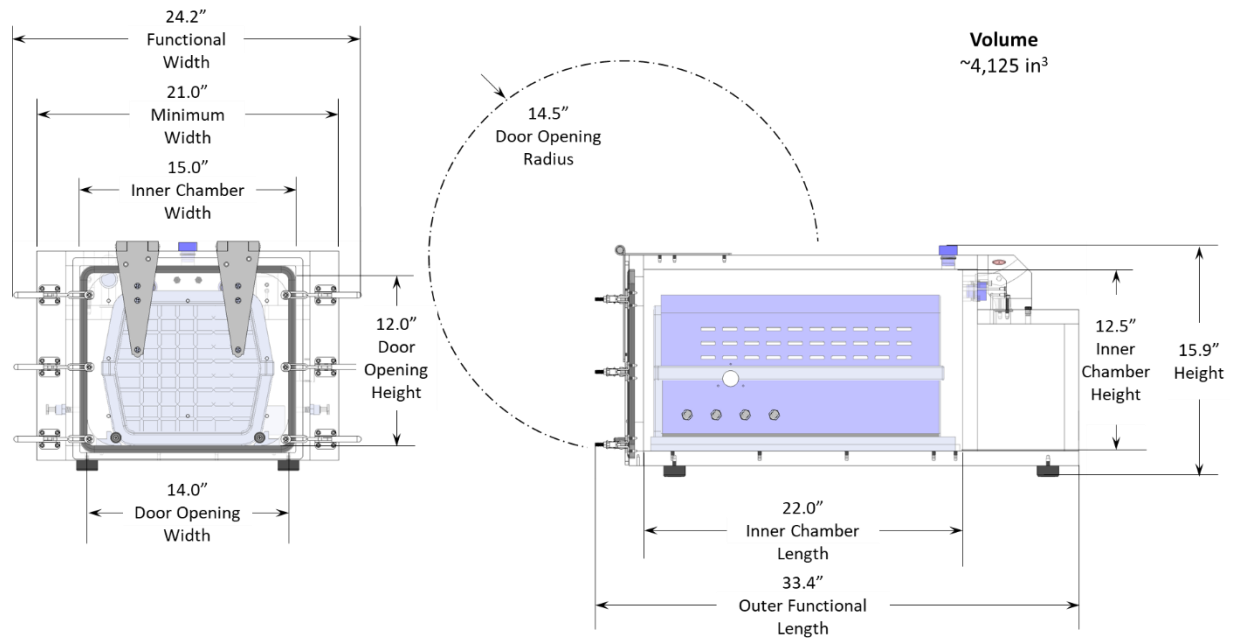
### ANIMAL CARRIER INCLUDED WITH LARGE, LARGE ANIMAL WBP CHAMBER (INCHES)

Part # 011417-001



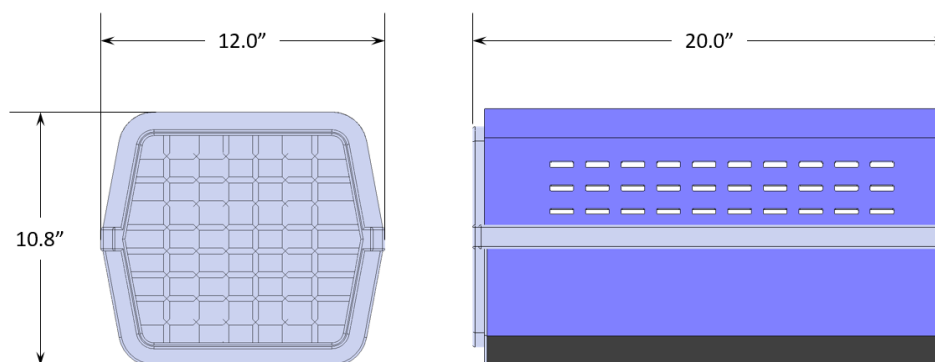
## MEDIUM, LARGE ANIMAL WBP EXAMPLE CHAMBER (INCHES)

Part # 601-1432-001



## ANIMAL CARRIER INCLUDED WITH MEDIUM, LARGE ANIMAL WBP CHAMBER (INCHES)

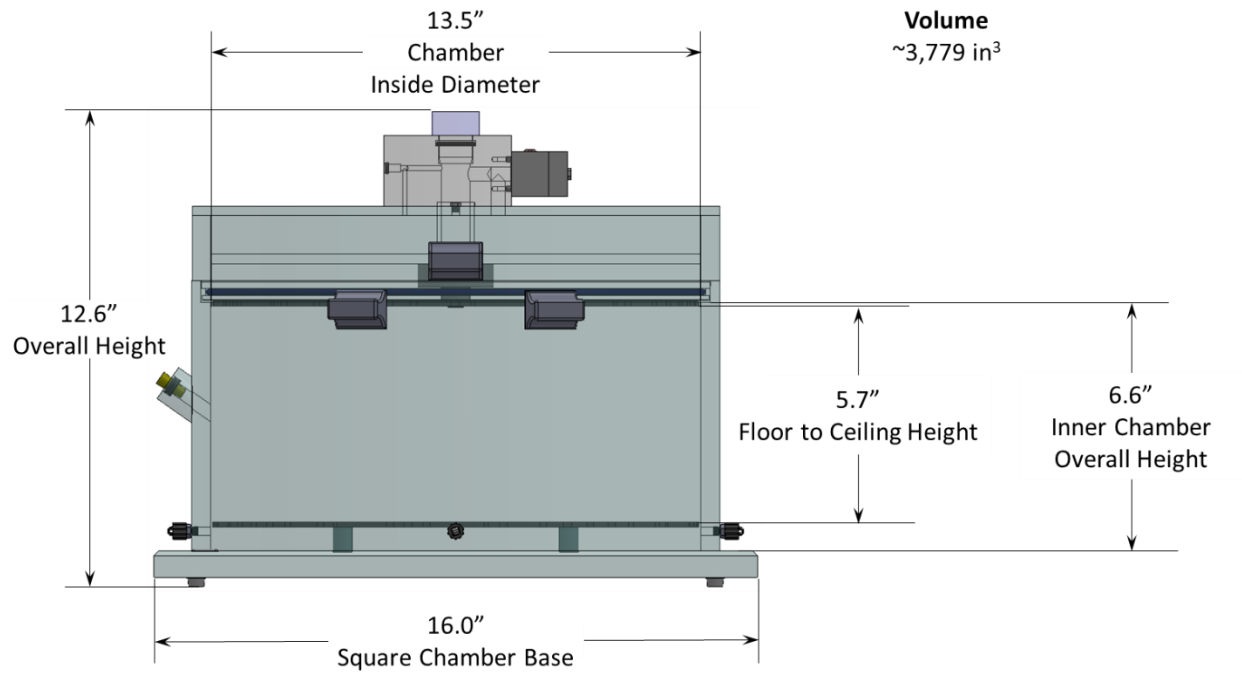
Part # 012074-001





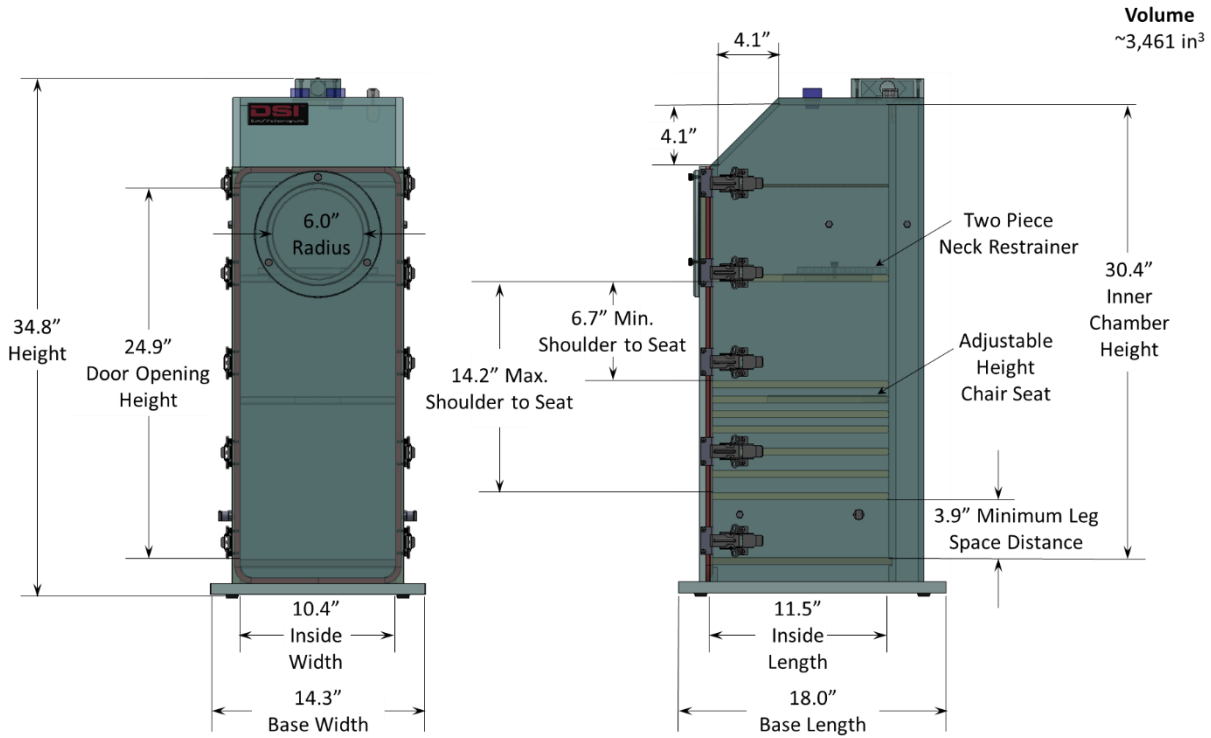
## RABBIT/FERRET WBP EXAMPLE CHAMBER (INCHES)

Part # 601-1431-001



## NHP WBP EXAMPLE CHAMBER (INCHES)

Part # 601-1434-001



## DERIVED PARAMETERS

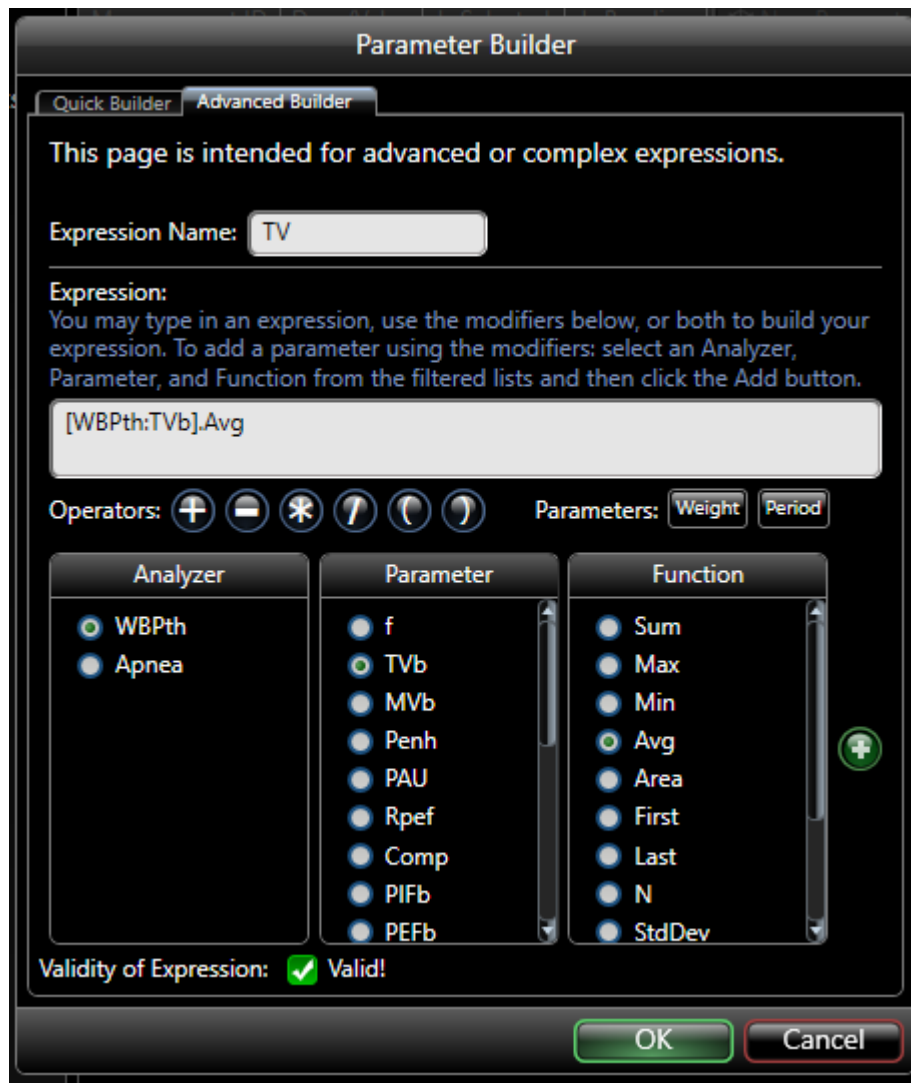
WBP

Parameter	Term	Units	Description	WBP AHR	WBP Volume
<b>F</b>	Frequency	BPM	The instantaneous, breath-by-breath rate of breathing	X	X
<b>TVb</b>	Tidal Volume (box)	mL	Tidal volume (volume inhaled) estimated from the Box Flow signal. It is equal to the product of the volume measure from the Box Flow and Comp	X	X
<b>MVb</b>	Minute Volume (box)	mL/min	Minute volume (the rate of ventilation) estimate from the Box Flow signal. It is equal to the product of the volume measured from the Box Flow, f, and Comp. Calculated on a breath-by-breath basis	X	X
<b>Penh</b>	Enhanced Pause	N/A	An indicator of bronchoconstriction. It is calculated as the following: $\left( \frac{T_e}{T_r} - 1 \right) \frac{PEF_b}{PIF_b}$	X	X
<b>PAU</b>	Pause	N/A	Provides a timing comparison of early and late expiration. An indicator for bronchoconstriction. It is calculated as the following: $\left( \frac{T_e}{T_r} - 1 \right)$	X	X
<b>Rpef</b>	Rpef	N/A	A ratio. Rate of achieving peak expiratory flow [Rpef = (time from Start of Expiration to PEF)/Te]	X	X
<b>Comp</b>	Compensation	N/A	The compensation factor computed from the temperature and humidity, which is applied to the flow and volume data to approximate the actual flows and volumes from the subject.	X	X
<b>PIFb</b>	Peak Inspiratory Flow (box)	mL/sec	The estimated maximum inspiratory flow that occurs in one breath	X	X
<b>PEFb</b>	Peak Expiratory Flow (box)	mL/sec	The estimated maximum expiratory flow that occurs in one breath	X	X
<b>Ti</b>	Inspiratory Time	Sec	The time spent inhaling during each breath, from the start of inspiration to the end of inspiration (determined by interpolation of start of expiration). The time flow is negative	X	X
<b>Te</b>	Expiratory Time	Sec	The time spent exhaling during each breath, from start of expiration to end of expiration (determined by interpolation back to zero). The time flow is positive	X	X
<b>EF50</b>	EF50	mL/sec	Expiratory flow at the point 50% of TV is	X	X

expired (Uncompensated)					
<b>EIP</b>	End Inspiratory Pause	ms	The pause between the end of inspiration and the beginning of expiration	X	X
<b>EEP</b>	End Expiratory Pause	ms	The pause between the end of one breath (end expiration) and the beginning of the next breath.	X	X
<b>Tr</b>	Relaxation Time	Sec		X	X
<b>TB</b>	Time of Brake (at end of inspiratory phase)	%	Reported in a % of baseline. Percentage of the breath occupied by transition from inspiration to expiration. Elongation of TB is an indicator of sensory irritation (stimulating trigeminal nerves in the upper respiratory tract)	X	X
<b>TP</b>	Time of Pause (at end of expiration)	%	Reported at a % of baseline. Percentage of the breath occupied by transition from expiration to inspiration. Elongation of TP is an indicator of pulmonary irritation (stimulating vagal nerve endings at the alveolar level)	X	X
<b>Tbody</b>	Body Temperature	C	The temperature in degrees Celsius		X
<b>Tc</b>	Chamber Temperature	C	Chamber temperature is either assumed or measured using a digital temperature sensor in the chamber		X
<b>RH</b>	Relative Humidity	%	RH is either assumed or measured using a digital humidity sensor in the chamber		X
<b>Rinx</b>	Rejection Index	%	Calculates the percentage of breaths rejected	X	X

## NEW PARAMETER ADVANCED BUILDER

The *Advanced Builder* allows you to build more complex algebraic combinations of parameters and functions. The *Advanced Builder* provides access to the full expression syntax.




**Figure 122.** The *Advanced Builder* tab in the *Parameter Builder*.

To use the *Advanced Builder*, you need to fill in the Expression Name and the Expression itself. This expression name is the parameter name in the report. The expression specifies how to summarize the measurement.

If you are familiar with the expression syntax, you can edit the expression directly since it is just a text field. Alternatively, you can use the user interface below it to help you. If FinePointe finds any errors in the syntax of the expression, it will not be able to compute a result. FinePointe will describe the problem following the **Validity of Expression:** text. Shown above there is no error as shown by the "Valid" following the Check.

To specify a parameter in the expression, perform the following:

1. Select an *Analyzer*. In this case **WBPth** has been selected.
2. Select a *Parameter* on that analyzer. In this case **TVb** has been selected.
3. Select a *Function* to perform over the parameter within the measurement interval. In this case, **Avg** has been selected, which means compute the average.
4. Click the  Button to append the parameter and function to the expression. In this example, it added the "[WBPth:TVb].Avg" to the expression, which means "compute the average of the TVb parameter on the WBPth analyzer".
5. Once you are satisfied with your selection, click **OK**.
6. You will return to the report wizard page. Click **Next**.

## CHECKING TEMPERATURE AND HUMIDITY SENSORS

After calibration, you should occasionally check the temperature and humidity sensors using the reference sensor provided. The sensors are high accuracy digital sensors which report temperatures within  $\pm 0.2^{\circ}\text{C}$  and humidity within  $\pm 1.8\%\text{RH}$ . The calibration procedure samples each of the sensors and makes small adjustments to the offset so that all sensors will read the same values. When the sensors wear out, the system is no longer able to adjust the offsets so that they read the same.

You can use the reference sensor to determine which sensors are worn out. To do this, start to acquire data after calibration.

- Setup the display to show the Tchamber and Hchamber values on the signal graphs.
- Allow the current sensors to stabilize. This should take no more than 15 seconds.
- Take note of the temperature and humidity values reported on the graph for site 1.
- Replace the temperature and humidity sensor with the reference sensor supplied with your system
- If the temperature value is more than  $1^{\circ}\text{C}$  or more than  $3\%\text{RH}$  of different between the sensors, then the sensor you have been running with is likely wearing out. If so, you should contact DSI for replacements. Make sure you do not run a study with the reference sensor. It should only be used for these tests.
- Repeat this test for the other sensors.

## DISPLAY SETUP

To setup the display in FinePointe Station so that you check the temperature and humidity sensors, go to the Signals Options by selecting Charts->Signals menu item.



The Signals Options form will be presented. Fill in the form settings as shown in the following figure:

Set the items circled as shown.

## APPARATUS TYPES

The apparatus tells FinePointe the signals you will acquire and analyzer tables you will produce and dictates aspects of your data collection protocol.

*Note: only the licensed apparatus will be displayed for selection within a study.*

The following table summarizes the various apparatus FinePointe supports:

Name	Description	Signals	Analyzer Tables
<b>RC Ventilated</b>	Traditional Invasive Resistance and Compliance	Flow Pressure Volume Blood Pressure (Optional) ECG (Optional)	RC BP (Optional) ECG (Optional)
<b>RC Static</b>	Resistance and Compliance with special ventilation for Static Compliance	Flow Pressure Volume Blood Pressure (Optional) ECG (Optional)	RCStatic BP (Optional) ECG (Optional)
<b>WBP AHR</b>	WBP for airway hyperresponsiveness	Box Flow Conditioned Box Flow Box Volume	WBP Apnea
<b>WBP Volume</b>	WBP for ventilatory parameters.	Box Flow Volume Tchamber Hchamber Tbody (Optional) Bias Flow Conditioned Box Flow	WBPth Apnea

Name	Description	Signals	Analyzer Tables
<b>NAM</b>	Non-invasive airway mechanics. Dual chamber mechanics using a method developed by Pennock	Thoracic Flow Nasal Flow Volume	NAM
<b>Cough</b>	Cough detection in a WBP chamber	Box Flow Box Flow Slope	Cough WBP
<b>Dosimetry</b>	Dosimetry while monitoring each subject's ventilation with a nose-only chamber	Flow Concentration Volume	Dose Tower
<b>PFT</b>	Pulmonary Function Testing. This apparatus acquires FRC, PV, and FV test data as well as RC.	Flow Volume Pressure Blood Pressure (Optional) ECG (Optional)	RC FV PV FRC BP (Optional) ECG (Optional)
<b>RC Pneumotach</b>	Resistance and compliance for flow measured with a pneumotach on the inspiratory line. This analysis does not yield expiratory parameters.	Flow Pressure Volume BP (Optional) ECG (Optional)	RC BP ECG
<b>BP</b>	For measuring a venous and arterial blood pressure.	CVP (Optional) BP (Optional) ECG (Optional) Tbody (Optional)	CVP ABP
<b>FDP</b>	Traditional flow derived parameters for use with head out, nose-only, or pneumotach.	Flow Volumae BP (Optional) ECG (Optional) Tbody (Optional)	FDP BP (Optional)