



***PharmaRAM™ II***  
**Installation  
and Users'  
Manual**



[Type text]

## Table of Contents

1	Introduction .....	5
2	Definitions .....	6
3	Safety.....	7
3.1	General Safety Considerations .....	7
3.2	Warnings and Cautions .....	7
3.3	Important Safety Notes .....	8
3.4	Hazardous Location Notes .....	8
3.5	Component Replacement.....	8
3.6	Customer Responsibility .....	8
3.7	Handling/Lifting .....	9
3.8	Guards and Safety Devices .....	<b>Error! Bookmark not defined.</b>
3.9	Technical Support for Mixer Operation: .....	<b>Error! Bookmark not defined.</b>
4	System Overview .....	11
4.1	ResonantAcoustic® Mixing Platform .....	11
4.2	Acoustic Enclosure .....	12
4.3	Touch Screen Human Machine Interface (HMI) .....	12
4.4	Standard Vessel Fixture and Vessels .....	13
5	System Specifications.....	14
5.1	Voltage Level.....	16
5.2	Power Consumption .....	16
6	Installation and Support .....	17
6.1	Unpacking, Lifting, and Placing <i>PharmaRAM™</i> II.....	17
6.2	Mounting.....	17
6.3	Door Operation .....	18
6.4	Remove the Shipping Lock Bar .....	19
6.5	Vessel Holder Assembly.....	19
6.6	Electrical Connections .....	21
7	Quick Start.....	22
7.1	Setup .....	22
7.1.1	Open the Hood Door(s) .....	22
7.1.2	Securing Container in the Vessel Holder.....	22
7.1.3	Close the Door.....	22
7.2	Power-Up.....	22
7.3	Login.....	23
7.4	Select the Recipe .....	24
7.5	Run the Recipe .....	24
7.6	Completion .....	25
8	HMI (Human Machine Interface) – Overview .....	26
8.1	Main Screen .....	26
8.2	Login.....	27
8.3	Operational Modes (Recipe and Auto).....	27
8.4	Alarming .....	27
8.5	Setup and Configuration Screens.....	27
8.6	Viewer.....	28
9	HMI Operation – Security and Login .....	29
9.1	Login Levels and Privileges .....	29

9.2	Screen Operations - Logging In/Out .....	30
9.3	Log Files .....	31
10	HMI Operation – Modes of Operation .....	32
10.1	Screen Operations - Recipe Mode .....	32
10.2	Screen Operations - Auto Mode .....	34
11	HMI Operation – Alarming .....	39
11.1	Screen Operations - Alarms .....	39
12	HMI Operation – Viewer.....	41
12.1	Screen Operations - Viewer.....	41
13	HMI Operation – Setup and Configuration .....	43
13.1	Status Tab .....	44
13.2	Calibration Tab .....	44
13.3	Recipe Tab .....	44
13.3.1	Screen Operations – Edit an Existing Recipe.....	44
13.3.2	Screen Operations – Create New, Rename, and Delete.....	48
13.4	Setup1 Tab .....	52
13.4.1	Auto Timer Group Box.....	52
13.4.2	Lighting Group Box .....	52
13.4.3	Machine Options Group Box .....	52
13.4.4	Operational Options Group Box .....	53
13.5	Setup2 Tab .....	53
13.5.1	Screen Operations – User Management.....	54
13.6	Setting Date and Time .....	55
13.7	Config Tab .....	55
13.7.1	Screen Operations – Edit a Configuration .....	56
13.7.2	Screen Operations – Create a Configuration .....	57
13.7.3	Configuration Usage .....	58
13.8	Data Tab.....	59
14	Care and Maintenance.....	60
14.1	Preventive Maintenance .....	60
14.2	Cleaning Procedures .....	60
14.3	Accelerometer Calibration .....	60
14.4	Maintenance .....	60
14.4.1	Major Repairs .....	60
14.4.2	Recommended Maintenance Schedule .....	61
14.5	Replacement of Serviceable Parts .....	61
14.5.1	Fuse Replacement .....	61
14.5.2	Bellows Replacement.....	62
14.5.3	Accelerometer Replacement.....	62
14.5.4	Technical Support for Mixer Operation:.....	62
15	Troubleshooting and Service .....	63
16	Warranty .....	65
16.1	Limited Warranty: .....	65



# 1 Introduction

The **PharmaRAM™** II Compounding Mixer is a groundbreaking, innovative, and versatile tool for the advanced compounding of individualized medicine in various *Pharmacy* settings.

The **PharmaRAM™** II allows the compounding *Pharmacist* to mix:

- a broad range of *Pharmaceutical* materials with exceptional uniformity of solid and liquid dosage forms
- for significantly shorter times than traditional methods
- in a sealed and dust-free environment, resulting in enhanced operator safety
- with high repeatability from mix-to-mix, ensuring reliable batch-to-batch product quality
- up to 1,000 grams of compounded medication

With the addition of a vacuum option, **PharmaRAM™** II effectively mixes and degasses semisolids like lotions, creams, ointments, and gels. With available vessels and attachments the **PharmaRAM™** also functions as a milling or sieving device.

Like the smaller **PharmaRAM™** I, the **PharmaRAM™** II Compounding Mixer is also based on ResonantAcoustic® technology.

## ResonantAcoustic® Mixing (RAM) and Acceleration

ResonantAcoustic® Mixing's (**RAM**) primary driving mechanism that creates mixing is Acceleration (rate of change of velocity). The unit of measure of acceleration in the International System of Units (SI) is meters per second squared, or  $m/s^2$ . A more familiar way to describe this phenomenon is the acceleration of gravity here on earth, or **g**. One **g** is the acceleration of gravity at the Earth's surface and uses the standard gravity symbol:  $g_n$ , defined as  $\sim 9.81$  meters per second squared.

**Acceleration** is the driving mechanism for acoustic mixing, stated in units of the acceleration of standard gravity - or **g** - as outlined above. For example, a heavily loaded mixture of solids with a viscous liquid may be best mixed at an **Acceleration** of 80 **g**, or 80 times the force of gravity.

The correct level of **Acceleration**, or **g** creates micro-mixing zones that liquids and viscous materials require, and creates the chaotic collision phenomenon that effectively mixes solids and powders. The process of determining an optimal **Acceleration**, or **g** to obtain the best mixing is an iterative one, arrived at through observation, optimization, and product quality testing. Resodyn Acoustic Mixers process engineers and technical sales staff are always available to provide assistance in this process.

Furthermore, **Acceleration** or **g** is measured the same way across all **RAM** technology platforms. So, 50 **g** on the **PharmaRAM™** II mixer is equivalent to 50 **g** on the **RAM 5** or **RAM 55** mixers.

It is also important to note that, while mechanical devices typically rely on *increasing* the power to improve mixing, better mixing with **RAM** technology is not necessarily the result of more power. Instead, the quality of mixing is the result of the *right combination* of energy applied to the materials - in the form of **Acceleration** or **g** - for an adequate amount of time. Therefore, some materials may be best mixed at a lower level of **Acceleration**.

## 2 Definitions

The terms and definitions below are frequently used in the installation and operation of ResonantAcoustic® Mixing (**RAM**) systems.

Acceleration:	A change in velocity with respect to time that is expressed in “g.” Different media mix at different accelerations, based on the material and the expected results. (See “g” below.)
Damping:	A term to quantify the instantaneous amount of energy absorbed by the mix media while mixing.
g:	A measure of acceleration expressed as a multiple of the gravitational acceleration applied to the vessel and mix media during mixing. For example, 10 g is 10 times the force of gravity. It may also be shown as g. Another term that may be used to describe the acceleration is “gravities.” (See “Acceleration” above.)
HMI:	Human Machine Interface. The control and input system screen used to operate the <i>PharmaRAM™</i> II.
Headspace:	The volume of compressible air, gas, or void space above the mixing media in the vessel that is not occupied.
Mixing Media:	Defined as the material inside the mixing vessel.
Mixing Power:	The amount of power being delivered by the <b>RAM</b> system to perform mixing.
Mixing Regime:	This term identifies certain modes of mixing. The mixing regime defines the bulk flow pattern of the mix during mixing. A regime changes when the bulk patterns change. For example, a stable fluid mixing regime for thick pastes would be one that flows from the bottom of the vessel up the center and then across the top and down the sides. Another mixing regime is when the flow pattern is reversed and the flow comes up the vessel sides and down the center of the vessel. .
<b>RAM</b> :	ResonantAcoustic® Mixing or ResonantAcoustic® Mixer.
<b>RAMWare</b> :	Control software that runs on a Personal Computer (PC) and provides control to, and feedback from, the mixing process. (Also <b>RAMware2</b> .)
Resonance:	The frequency (nominally 60 Hz) at which the mechanical system operates in the most efficient manner.
Vacuum:	Internal vessel pressure that is less than atmospheric pressure.

## 3 Safety

Every effort has been made to assure that the *PharmaRAM*™II is easy to use, reliable, and safe. This section outlines the general safety considerations and defines caution and warning symbols used throughout this manual.



### 3.1 General Safety Considerations

For safe operation, the *PharmaRAM*™II should be operated only within the limits outlined in the system specifications. The following classification defines acceptable use for *PharmaRAM*™II.


- Indoor use only.
- Main supply voltage fluctuations are not to exceed  $\pm 10\%$  of the nominal supply voltage.
- This equipment is suitable for continuous operation.
- For use in non-hazardous environments as classified by the United States National Electrical Code (NEC).

### 3.2 Warnings and Cautions

Throughout the manual, the following symbols are used to identify warnings and cautions:

	The caution symbol indicates a potential hazardous situation which could result in minor injury or damage to the product.
	<p>The high voltage symbol indicates the possibility of electrical shock.</p> <p>This symbol means <u>turn off</u> the electrical supply before removing any cover with the symbol attached. Failure to do so may cause exposure to electrical shock hazard.</p> <p>Access to electrical components should only be carried out by a licensed electrician or qualified electrical engineer.</p> <p><b>NEVER</b> attempt to modify any electrical components or circuits as this may affect the safe operation of the machine.</p>

### 3.3 Important Safety Notes


	<p>This equipment should only be operated by trained and qualified personnel.</p> <p>Mixing operations can generate heat and internal pressure depending on material and mixer accelerations. Do not mix materials longer than what has been characterized as safe.</p> <p>Do not attempt to run the machine without a mix container holder. Equipment damage may result.</p> <p>Do not disable or tamper with any safety items, such as safety interlock switches located on the <i>PharmaRAM™II</i> system.</p> <p><b>Note:</b> Changes in noise level or frequency are common during mixing operations. If rattling, metal-on-metal, or obnoxious noises occur, turn off the <i>PharmaRAM™II</i> and call or email the Resodyn Acoustic Mixers Technical Support.</p>
---	--

### 3.4 Hazardous Location Notes

The *PharmaRAM™II* system is designed to be operated in non-hazardous environments.

### 3.5 Component Replacement

The system is designed with components that are specifically rated for use with the *PharmaRAM™II* machine. Only replace worn or damaged components with direct factory replacement parts or parts approved by Resodyn Acoustic Mixers. Incorrect component replacement can impair the safety of the equipment and risk injury to personnel.

	<p>Do not replace components with non-factory components. Non-factory replacement parts may not be rated to be used to the <i>PharmaRAM™II</i> machine requirements, which will compromise the safety of the operating personnel and may cause damage to the equipment.</p>
---	---

### 3.6 Customer Responsibility

- Ensure that all operators have received the correct training to operate the mixer.
- Ensure that all operators have read and understood this instruction manual.
- Ensure that a qualified electrician carries out any electrical maintenance.
- Allow only Resodyn Acoustic Mixers Service Engineers to repair a *PharmaRAM™II* or return to Resodyn after receiving a Return Authorization.

### 3.7 Handling/Lifting

The LabRAM II mixer is 260 lbs. with no additional options. The mixer should be lifted by up to 4 people, one on each side. The TWO primary lifting positions are on either side of the LabRAM II machine where RETRACTABLE, integral LIFTING HANDLES ARE LOCATED (Figure 1 below). DO exercise caution when lifting and moving the equipment to avoid striking other objects.

Two remaining personnel can assist in lifting the LabRAM mixer at the remaining two sides next to the machine feet. There is ~1 ½" clearance under the LabRAM II. This space allows the retractable handles to be securely positioned under the machine when not in use. The LabRAM II mixer should be lifted, at the locations indicated below, by up to 4 people, positioned at each side of the machine as designated by circles in the diagram below. The arrows show the recommended locations to place the hands for lifting the machine using a combination of base plate hand-holds and base plate retractable handles.

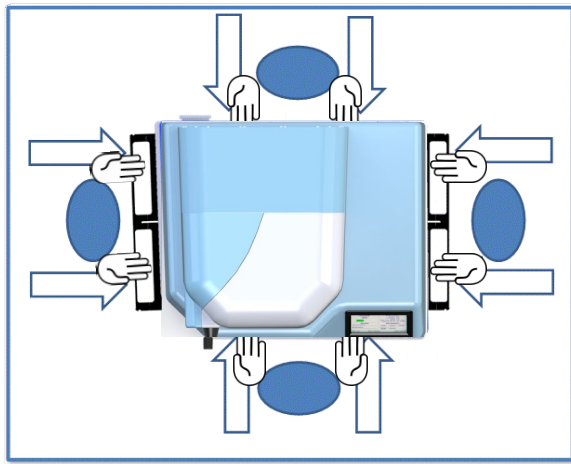


Figure 1 – Overhead View, lifting positions and

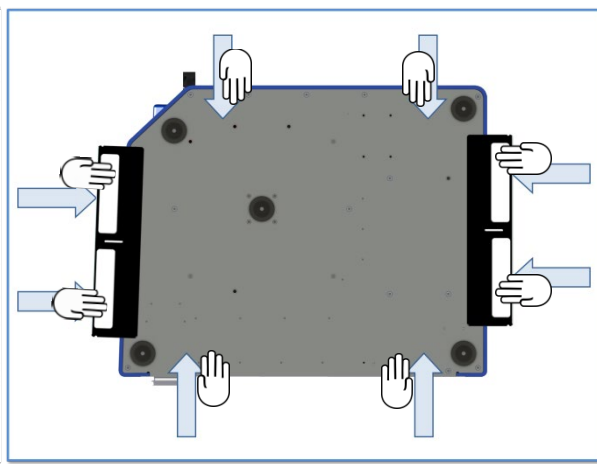


Figure 2 - Underside View, lifting positions and handles

Figure 2 shows the underside of the mixer indicating the recommended location of the hands for lifting and carrying the LabRAM II machine using retractable handles.

Do not lift using any location other than the retractable handles of the mixer's baseplate and the hand holds as indicated above. Doing so may cause damage and failure of the LabRAM II machine and may cause injury.



**NOTE:** For safe lifting and transporting of the mixer, the mixer should be lifted by up to 4 people, one on each side as shown above.

### 3.8 Guards and Safety Devices

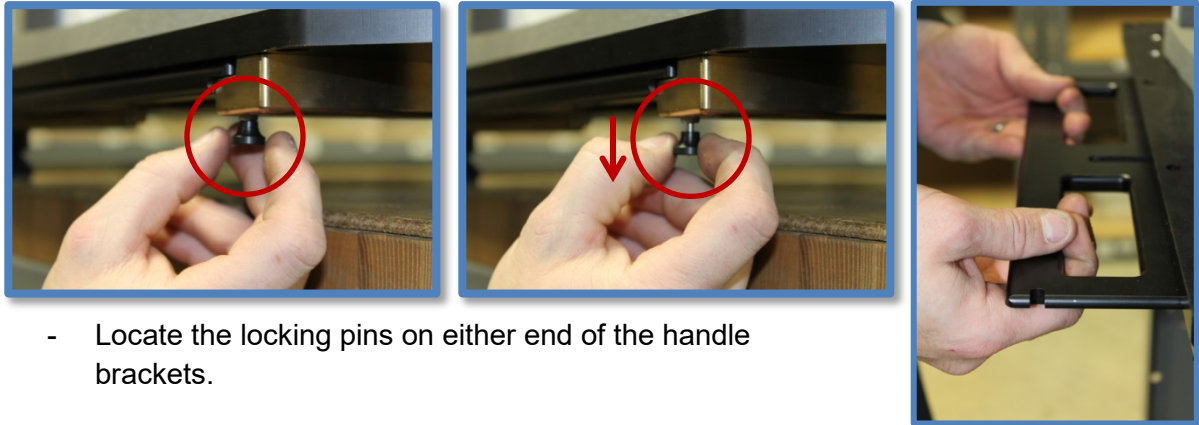
Ensure all safety devices (limit switches, etc.) are functioning correctly, and regularly check their operation.

### 3.9 Using Retractable Handles

When the LabRAM II has been located in the area of final installation, make sure the area is prepared and ready for installation. Carefully follow the unpacking instructions in Section 6 on Page 15 of the User's Manual.

Retractable handles are located on both sides of the LabRAM II, installed in the base plate conveniently out of the way when not in use.

When you are prepared to lift and place the machine:



- Locate the locking pins on either end of the handle brackets.
- Pull straight down to release the locking pins while pulling the handles horizontally toward you until they click-lock into the *open* position.
- Reverse the procedure when the LabRAM II is in its intended position. The locking pins will automatically click-lock back in place after the handles have been slid horizontally back under the machine. Make sure the closed-lock position is attained.
- Make sure to check for any materials or other blockage below the machine if the handles to not smoothly return to their original position.

### 3.10 Technical Support for Mixer Operation:

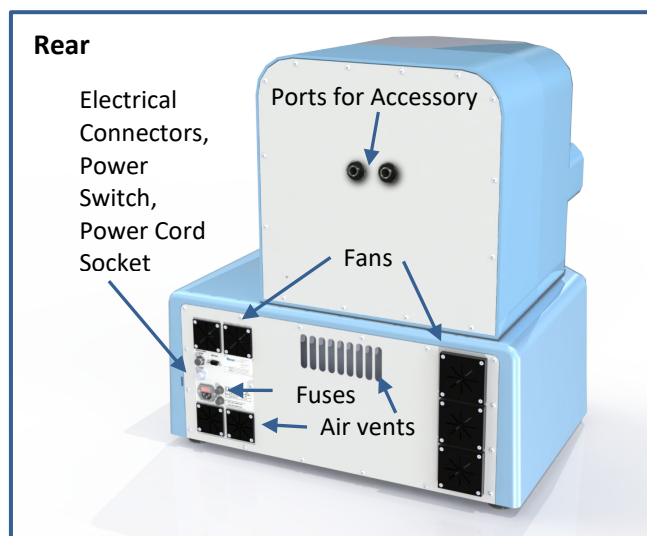
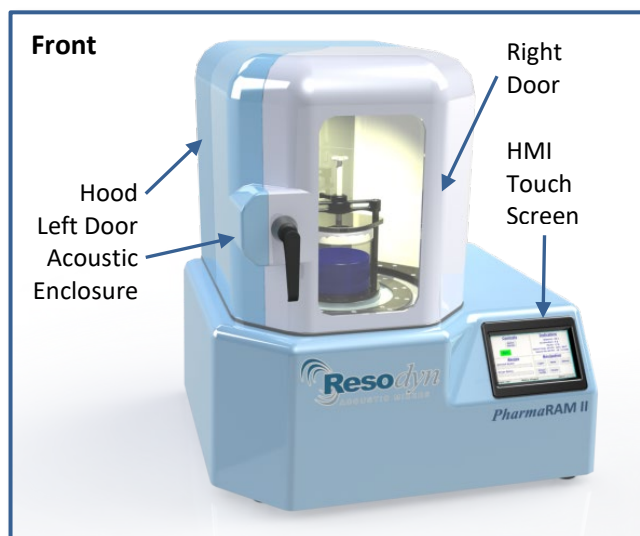
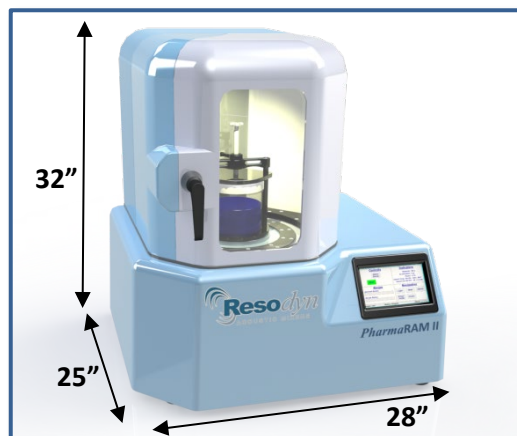
If necessary, contact your Resodyn Acoustic Mixers customer service representative for questions or the contacts provided below for additional technical support.

Technical Support for Mixer Operation:

Phone: (406) 497-5333 Fax: (406) 497-5206 e-mail: <a href="mailto:service@resodynmixers.com">service@resodynmixers.com</a>	Resodyn Acoustic Mixers 130 North Main, Suite 630 Butte, Montana 59701
--	--

## 4 System Overview

The *PharmaRAM*™ II mixer is a ResonantAcoustic® Mixer (**RAM**) specifically designed and manufactured to mix 2.2 lbs. (1 kg) of *Pharmaceutical* or compounded materials. The highly versatile mixing system is designed for laboratory and production environments. The *PharmaRAM*™ II system is equipped with proprietary mixing control circuitry, a vessel holder, machine safety interlocks, and a molded plastic acoustic enclosure. The *PharmaRAM*™ II external features include the Acoustic Enclosure, Hood, Left and Right Door, Touch Screen Human Machine Interface (HMI), Power Switch, Electrical Connectors and Fuses, Cooling Fans and Air Vents.



### 4.1 ResonantAcoustic® Mixing Platform

The *PharmaRAM*™ II delivers energy to the material being mixed by accelerating the platform up to 100 g of acceleration.



## 4.2 Acoustic Enclosure

The acoustic enclosure surrounds the patented resonator system. The enclosure reduces the sound emitted by the *PharmaRAM™II* and covers all the moving parts that could pose a risk to operators.

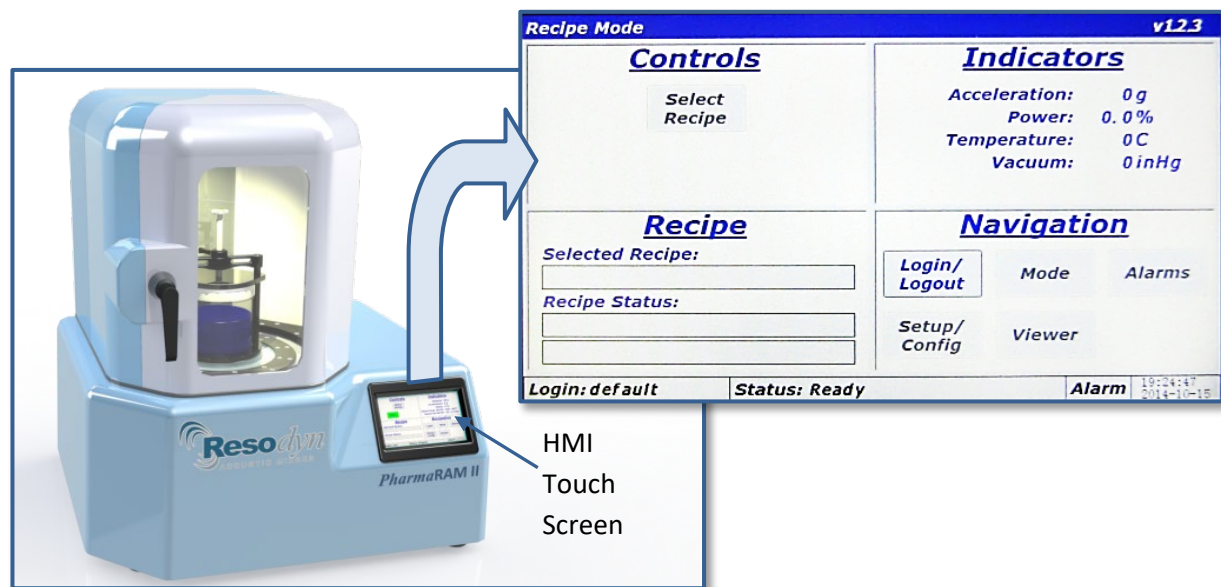


During operation the Payload Plate, Driver Plate, Fixture, and Vessel, are accelerating up to 100 g of acceleration at nominally sixty times per second. Serious bodily injury is possible if one comes into contact with these moving surfaces.



## 4.3 Touch Screen Human Machine Interface (HMI)

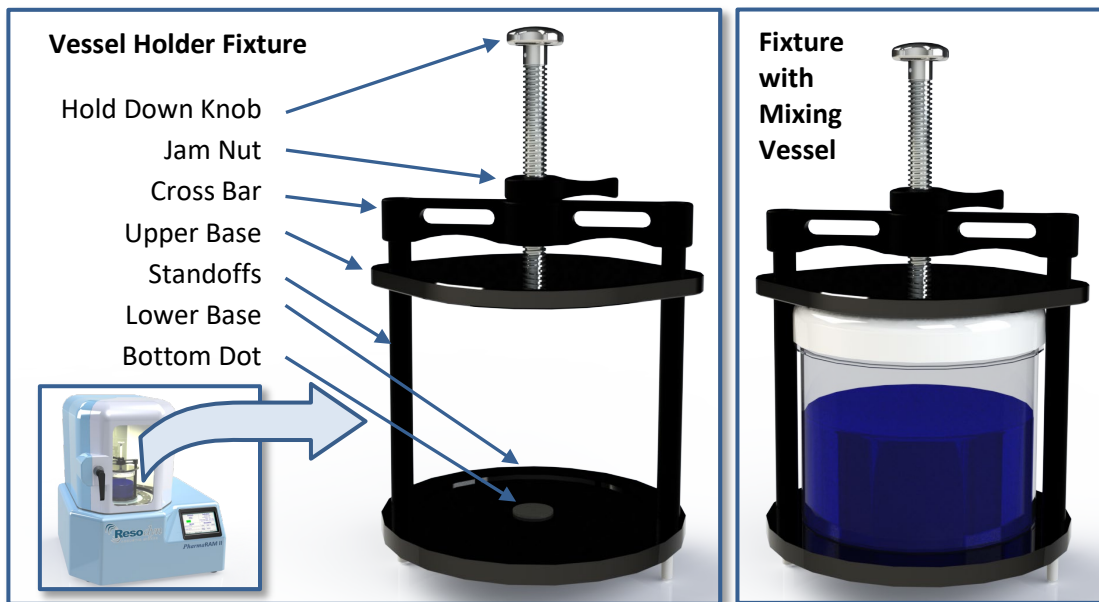
The HMI is the primary user interface on the *PharmaRAM™II*. The *PharmaRAM™II* is completely digitally controlled through the HMI. All data entry and operations are provided through software keypads and buttons on the screen. The touch screen and operating system is described below and in more detail in Section 8 HMI (Human Machine Interface) – Overview.





#### 4.4 Standard Vessel Fixture and Vessels

A variety of vessel sizes and types, along with the appropriate hold-down fixtures are available for the *PharmaRAM™II*. The standard and supplied vessel hold-down fixture is a 5" diameter vessel holder that accommodates vessel between the heights of 2.5" and 5.125". For vessels shorter than 2.5", spacers can be purchased from Resodyn Acoustic Mixers. Many applications call for specialized, custom hold down fixtures. Resodyn is fully equipped to handle virtually any shape of vessel a particular mixing application requires. Please contact your Resodyn Acoustic Mixer sales representative to learn more.



The *PharmaRAM™II* hold-down fixture is made of several key components. These are the hold-down knob, jam nut, cross bar, bolts, standoffs, upper base, and lower base shown above in sequence and described in more detail below..

**Hold-down Knob.** Turning the Hold-down Knob clockwise clamps the vessel in place. The knob is coupled to specialized thread designed for strength and accuracy. The thread is connected to the **Upper Base**. Turning the knob raises and lowers the **Upper Base**.

**Jam Nut.** The Jam Nut is used to lock the vessel in place. When tightened against the top of the **Cross Bar**, the **Jam Nut** locks the **Hold-down Knob** and prevents loosening during operation. The **Jam Nut** is set after the mixing vessel is tightened down using the **Hold-down Knob**.

**Vessel Spacer** (not shown). The Vessel Spacer accommodates various vessel heights in the vessel holder for mixing. Shorter vessels may require one or more spacers stacked together. Any mixing vessel must be securely positioned within the upper and lower bases of the hold-down fixture. If the mixing vessel is not secure in the vessel holder, damage may occur to the machine, vessel, and the mixing material. If you require vessel spacers, please contact your Resodyn Acoustic Mixers sales representative.

## 5 System Specifications

The *PharmaRAM™* II is equipped with the following external connectors: 1) Inlet power, 2) Mini USB, 3) Fuses (X2), and 4) Communication Connector for Automatic Vacuum System. All external connections are found in the back panel of the *PharmaRAM™* II machine. See Page 20 for a detailed illustration.

The *PharmaRAM™* II overall system specifications are provided in Table 5-1.

**Table 5-1. *PharmaRAM™* II System Specification.**

Maximum Payload Capacity	2.2 lbs.
Sealed Enclosure	Yes
Sound Emitted	<70 dB at 3' at 100 g with an empty vessel.
Vessel Temperature Monitoring	3 RTD's monitored and recorded (optional)
Automatic/Programmable Vacuum	Yes (optional)
Data Logging	Yes
Remote Operation	Yes
Computerized Operator Interface	Yes
Weight	260 lbs. plus vessel holder fixture
Dimensions (Resonator)	28" W 25" D 32" H
Electrical @ 50/60 Hz, CE Certified	100-120 / 200-240 VAC



**NOTE:** The *PharmaRAM™* II system weighs approximately 260 lbs. without a fixture and should be handled by a minimum of four people lifting the machine at corners. Make sure to use safe and adequate lifting procedures. The lifting procedures are described in Section 3.7 Handling/Lifting

The LabRAM II mixer is 260 lbs. with no additional options. The mixer should be lifted by up to 4 people, one on each side. The TWO primary lifting positions are on either side of the LabRAM II machine where RETRACTABLE, integral LIFTING HANDLES ARE LOCATED (Figure 1 below). DO exercise caution when lifting and moving the equipment to avoid striking other objects.

Two remaining personnel can assist in lifting the LabRAM mixer at the remaining two sides next to the machine feet. There is ~1 ½" clearance under the LabRAM II. This space allows the retractable handles to be securely positioned under the machine when not in use. The LabRAM II mixer should be lifted, at the locations indicated below, by up to 4 people, positioned at each side of the machine as designated by circles in the diagram below. The arrows show the recommended locations to place the hands for lifting the machine using a combination of base plate hand-holds and base plate retractable handles.

Figure 2 shows the underside of the mixer indicating the recommended location of the hands for lifting and carrying the LabRAM II machine using retractable handles.

Do not lift using any location other than the retractable handles of the mixer's baseplate and the hand holds as indicated above. Doing so may cause damage and failure of the LabRAM II machine and may cause injury.



**NOTE:** For safe lifting and transporting of the mixer, the mixer should be lifted by up to 4 people, one on each side as shown above.

### **5.1 Guards and Safety Devices**

Ensure all safety devices (limit switches, etc.) are functioning correctly, and regularly check their operation.

### **5.2 Using Retractable Handles**

When the LabRAM II has been located in the area of final installation, make sure the area is prepared and ready for installation. Carefully follow the unpacking instructions in Section 6 on Page 15 of the User's Manual.

Retractable handles are located on both sides of the LabRAM II, installed in the base plate conveniently out of the way when not in use.

When you are prepared to lift and place the machine:

- Locate the locking pins on either end of the handle brackets.
- Pull straight down to release the locking pins while pulling the handles horizontally toward you until they click-lock into the *open* position.
- Reverse the procedure when the LabRAM II is in its intended position. The locking pins will automatically click-lock back in place after the handles have been slid horizontally back under the machine. Make sure the closed-lock position is attained.
- Make sure to check for any materials or other blockage below the machine if the handles do not smoothly return to their original position.

### **5.3 Technical Support for Mixer Operation:**

If necessary, contact your Resodyn Acoustic Mixers customer service representative for questions or the contacts provided below for additional technical support.

Technical Support for Mixer Operation:

	Phone: (406) 497-5333 Fax: (406) 497-5206 e-mail: <a href="mailto:service@resodynmixers.com">service@resodynmixers.com</a>	Resodyn Acoustic Mixers 130 North Main, Suite 630 Butte, Montana 59701
	. The system should be located on a sturdy table or bench that will hold the mixer and any auxiliary equipment, supplies or loads.	

#### **5.4 Voltage Level**

The *PharmaRAM*™II is designed to utilize single phase 100-120 or 200-240VAC 50Hz/60Hz supply voltages for use worldwide.

#### **5.5 Power Consumption**

The mixer is designed to be very efficient by operating at a resonant condition. Nominal power consumption while operating at 90g of acceleration with an empty vessel is ~120W (0.69 Power Factor). During normal operation, the *PharmaRAM*™II will draw between 200 and 1000 Watts. When the machine is not mixing, it will pull around 80 Watts from the power supply.

## 6 Installation and Support

### 6.1 Unpacking, Lifting, and Placing PharmaRAM™ II

Upon receipt of the **PharmaRAM™ II**, do not unpack or remove any packaging materials until positioned as close to the installation location as possible. When in position, remove all wrapping and strapping, and shipping paperwork for your records.

*Retain all packaging material for 1 year, should machine movement or unexpected warranty service be required. Original packaging will be required for service shipment during the warranty period and is highly recommended for any shipment that may be required during the entire life of the product.*

- Open the top of the box and remove any packing materials, bubble wrap or other items.  
When all packaging material is removed, slide the packaging box/sleeve up and over the **PharmaRAM™ II**. The **PharmaRAM™ II** should be the only remaining item, resting on cushioning bags in a corrugated tray on the shipping pallet.
- Check to ensure that the following components are included in the shipment:
  - Power cable
  - Standard vessel holder in box
  - Two polystyrene mixing vessel sizes
    - 8 fl.oz. and 16 fl.oz.
- Make sure to remove any loose packaging material from the area before attempting to move or install the **PharmaRAM™ II**
- With a minimum of four people lifting at all four corners, and using appropriate lifting practices, the **PharmaRAM™ II** can be lifted straight up and carried to its installation location. See Section 3.7 on page 9.
- When placing the **PharmaRAM™ II** at its location, allow enough room around the machine to complete the installation, route wires, and allow for working space, etc.
- After installing the vessel holder (Section 6.5 Vessel Holder Assembly) and making all necessary connections to any accessories such as vacuum systems, re-locate the **PharmaRAM™ II** to its final position.

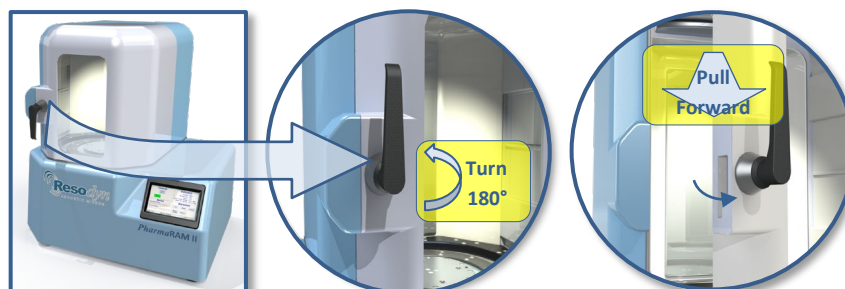
### 6.2 Mounting

The **PharmaRAM™ II** should be installed on a stable, rigid surface capable of supporting the machine weight and operation. If other equipment or materials are to be placed or used on the same surface, a higher weight rating should be used as appropriate.

ResonantAcoustic® Mixing (**RAM**) technology imparts near zero forces to the surface on which it is mounted. Careful placement and leveling by a qualified technician is recommended, as is periodic inspection of the positioning and condition of the surface. Surrounding instruments and accessories should be considered in an overall placement plan.

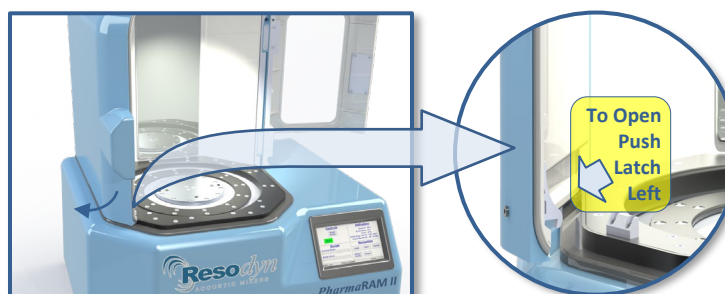
### 6.3 Door Operation

To access resonator plate and mixing chamber and install the vessel holder, turn the door handle counterclockwise 180°, releasing the right-hand section of the door. Pull the handle outward to open. **NOTE:** When power is supplied to the *PharmaRAM™II*, the mixing chamber is lit internally whenever the doors are fully closed and secured. The light will automatically turn off when the door is opened.

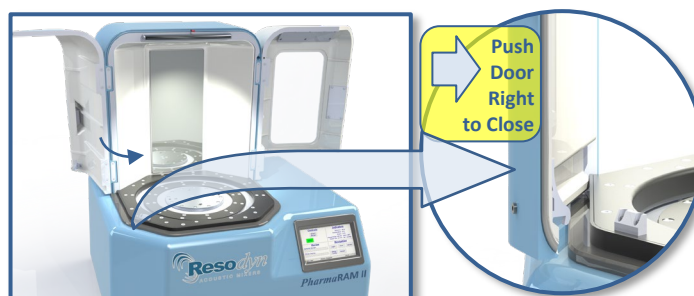


To open the left section for better access to the mixing chamber, locate the door latch near the lower left hand corner of the hood opening.

Release the door catch at the lower left as shown below by pushing the top of the latch lever toward the left until it clears the catch, allowing the door to swing open.



To reclose the left-hand door, swing the open panel to the right until the latch re-engages with the catch. The right-hand door must be properly closed and latched with the left-hand door. The *PharmaRAM™II* cannot be operated without the right-hand, viewing door open. The right-hand door functions as an interlock. Make sure to close the left-hand door first to maximize the interlock function.

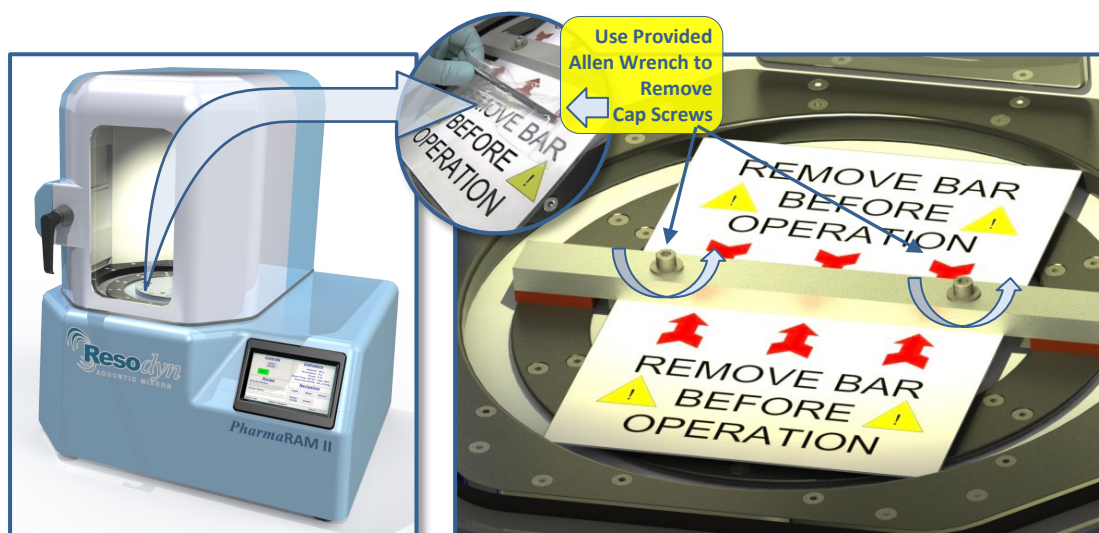




## 6.4 Remove the Shipping Lock Bar

The *PharmaRAM™ II* is shipped with a Lock Bar to secure the resonator during transportation. The Lock Bar **MUST** be removed before proceeding with installation or attempting to operate the *PharmaRAM™ II*.

Remove the 3/16" Allen wrench from its shipping bag attached to the Warning Label. Using the provided Allen Wrench, remove the two 1/4-20 socket head cap screws securing the lock bar across the mixing platform. Remove the Lock Bar by lifting it off of the platform and retain it along with screws for future re-positioning or transport of mixer. A Resodyn case is provided for your documentation, manuals, and other materials like this hardware.



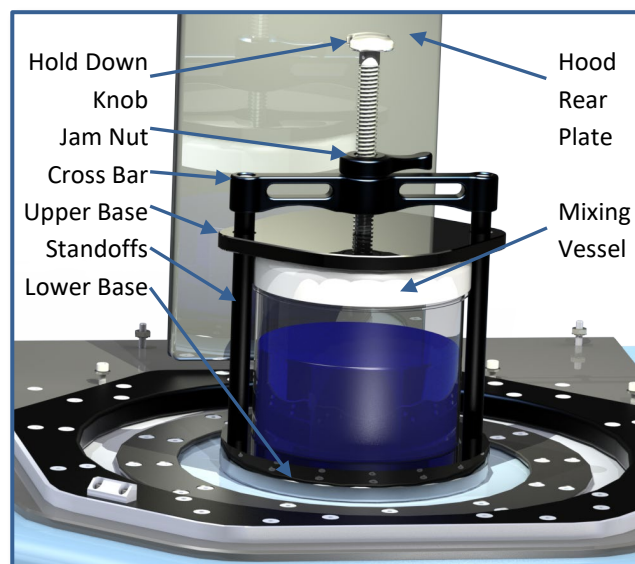
Once the shipping bracket has been removed, the vessel holder assembly can now be installed using the instructions that follow.

## 6.5 Vessel Holder Assembly

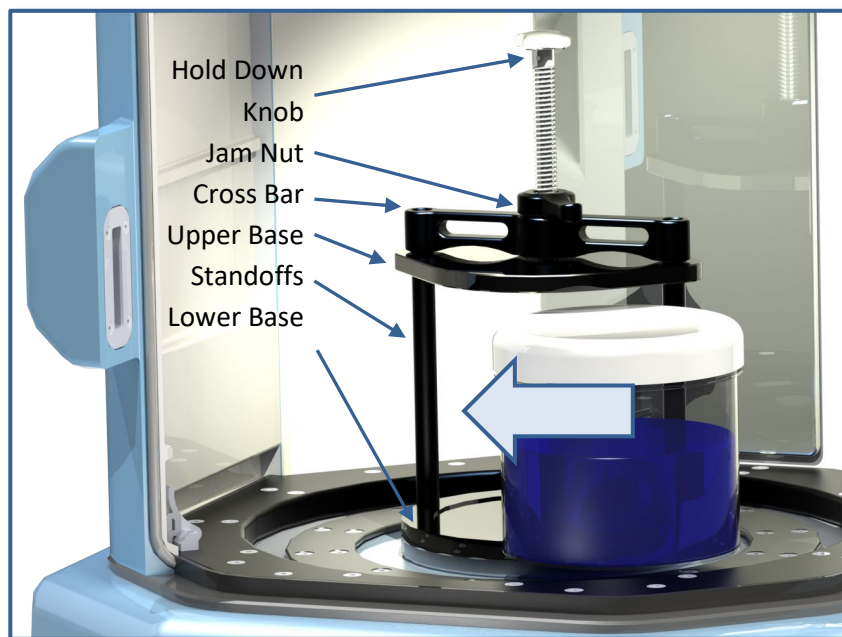
Remove the Vessel Holder Assembly from the accessory box accompanying the shipment.

**NOTE:** The Hold-Down Fixture is shipped with nuts fastened to the bottom of the 1/4-20 socket head cap screws. These nuts hold the fixture together during shipment. Remove these two nuts and store them with other hardware. Be careful **NOT** to remove or change the orientation of the components until familiar with the parts and the assembly.

The Vessel Holder is loosely assembled. Follow the positioning and sequence below for installation, or if reassembly or fixture movement is needed in the future.



Make sure the long, 1/4-20 socket head cap screws are positioned properly throughout the overall Vessel Holder assembly. The cap screws must pass through the Top Cross Bar, Upper Base, Standoffs, and Lower Base as shown. Thread the two 1/4-20 socket head cap screws into the Top Plate loosely, alternating between screws. When fully seated, torque each cap screw to 8 ft-lbs using a 3/16" Allen head tool.



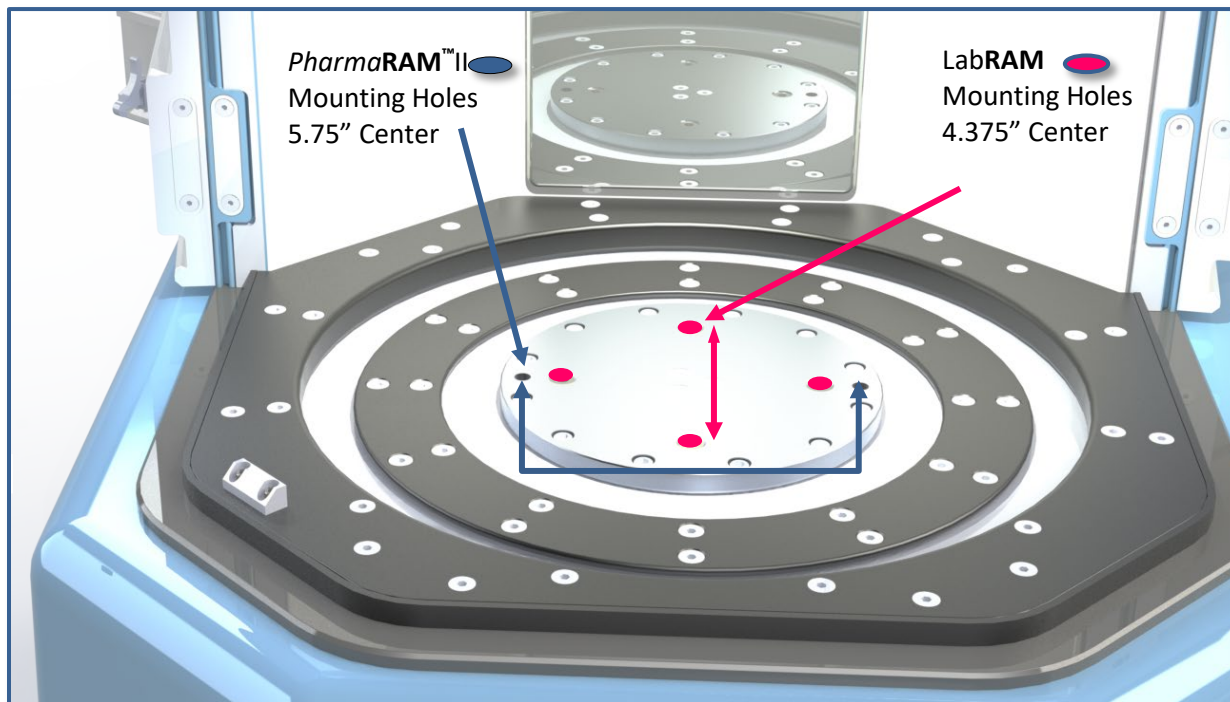
On the highest setting, the *PharmaRAM*™II mixer payload accelerates at 100g of acceleration, where 1 g equals the acceleration of gravity on the surface of the earth. Care should be taken to secure the screws as tightly as possible with the tool provided to avoid the Fixture and Vessel from loosening during operation.

All Vessel Holder assemblies, standard or custom, will match a hole pattern in the Top Plate. Mounting hole pattern for the standard 5" vessel holder is 1/4-20 threads measuring 5.75" center-to-center.

The mounting plate that comes standard with the *PharmaRAM*™II also has mounting holes to accept fixtures and vessels from other ResonantAcoustic® Mixer platforms, like the original Lab*RAM*. The fastener holes are four 1/4-20 threads measuring 4.375" center-to-center.

See the detailed illustration on the next page for the position of these mounting holes.

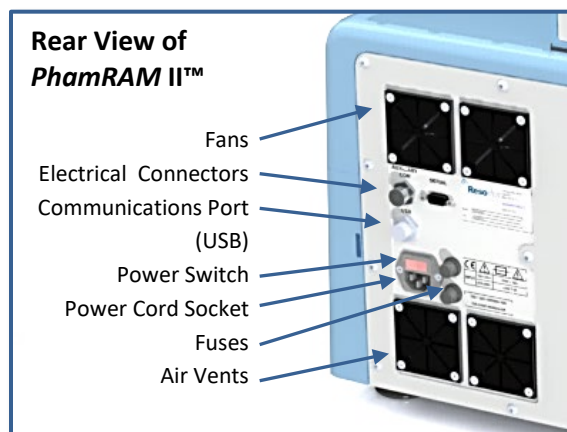




**Figure 2 Resonator Plate Mounting Hole Locations** (*PharmaRAM™ II* shown without doors for illustration purposes.)

## 6.6 Electrical Connections

Electrical power is provided to the *PharmaRAM™ II* through the cord labeled “Power” which connects to the power cord socket on the back panel of the *PharmaRAM™ II*. The electrical source and fuses should be rated for the supply power for your area. The following cord and fuse ratings for the voltages are as follows: 10 Amps for 100-120 VAC and 8 Amps for 200-240 VAC. Plug one end of the power cord into the power cord socket in the rear of the machine and plug the other end into the wall power receptacle.



## 7 Quick Start

This section defines the minimum steps required to operate the *PharmaRAM™* II. All instructions and guidelines in Section 6 must be completed before attempting a Quick Start or operation of the *PharmaRAM™* II.

### 7.1 Setup

To first set up the *PharmaRAM™* II mixer, the mixing vessel must be installed. The fixture must have a vessel installed before operating the mixing vessel.

#### 7.1.1 Open the Hood Door(s)

Door operation is described in detail and illustrated in Section 6.3 - Door Operation, above.

#### 7.1.2 Securing Container in the Vessel Holder

Place the mixing vessel centered on of the Lower Base, making sure to align over the bottom dot, as described in Section 6.5 Vessel Holder Assembly. If missing, please call Resodyn Customer Service at 406-497-5333. Turn the Hold-Down Knob clock-wise at the top of the fixture until snug, to fasten the Mixing Vessel in place. Tighten the Jam Nut to lock the Vessel Holder assembly together. The mixing vessel should not feel loose if grabbed and moved while fastened in the holder. If the vessel feels loose, tighten the Hold-Down Knob further. Vessel spacers may also be used under the mixing vessel when mixing in short vessels.

#### 7.1.3 Close the Door

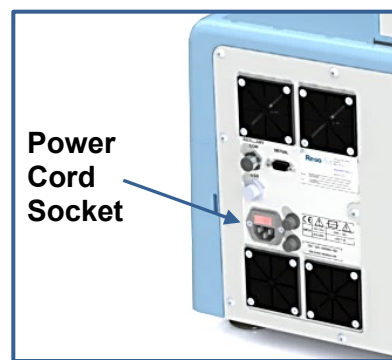
Door operation is described in detail and illustrated in Section 6.3 - Door Operation, above. The status on the HMI screen should read “Ready” and a green start button should be displayed if in “Auto” mode and in “Recipe” mode if a recipe has been chosen.

### 7.2 Power-Up

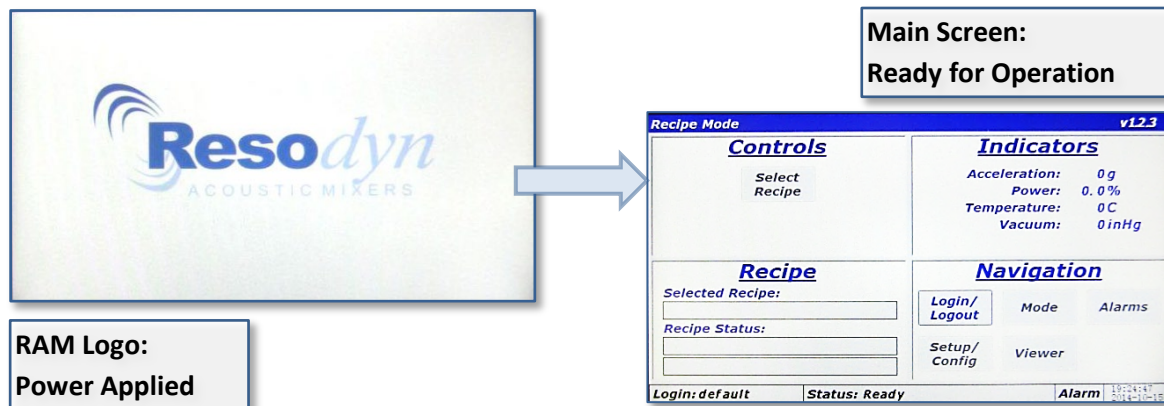
Plug the provided power cord into the Power Cord Socket (shown at right) and a wall outlet.

Switch the power switch (located above the power cord entry) to the on or “I” position.

When power is applied to the system, the Resodyn Acoustic Mixers screen is displayed on the HMI screen. When ready for operation, the second screen shown on the following page to the lower right will be displayed. This screen, shown after the boot-up is complete, displays “Recipe Mode” in the title bar, and will be referred to as the “Main Screen” throughout this Manual.



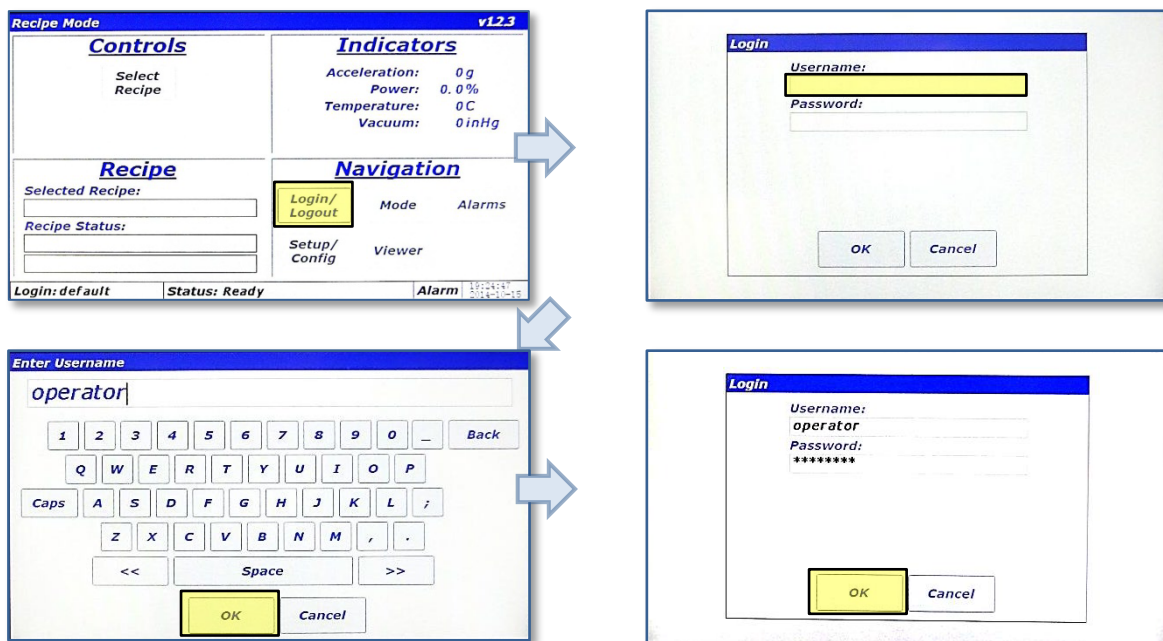
[Type text]



### 7.3 Login

Before running the *PharmaRAM™II*, a user login is required. For quick-start, the lowest level login will be used. Both the username and password are “operator.”

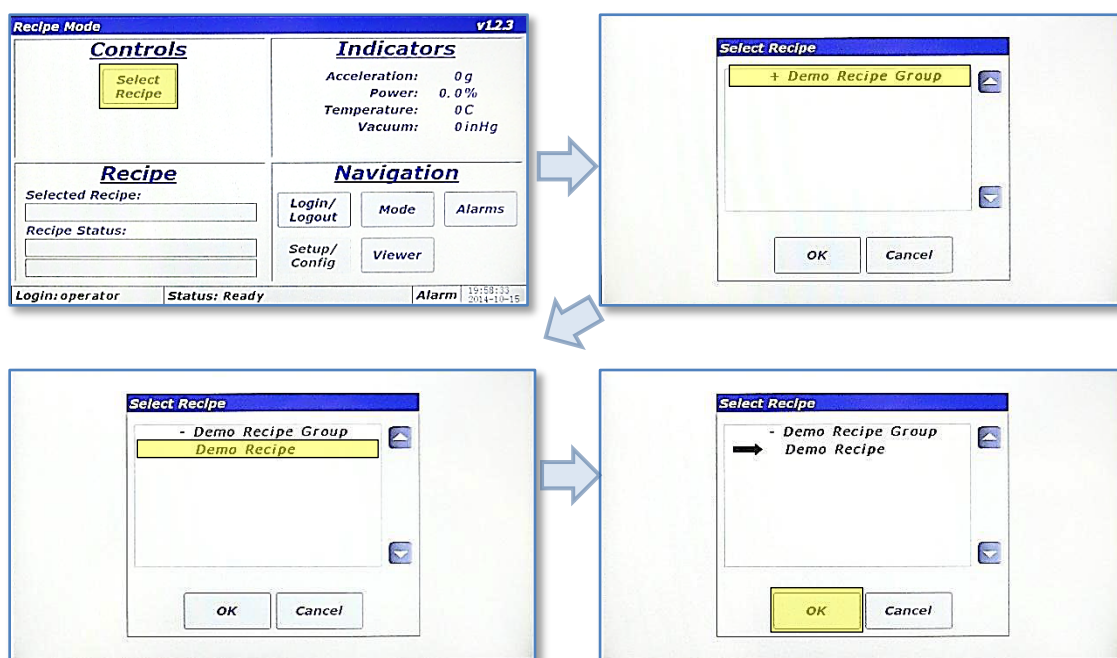
1. Touch the <Login/Logout> button.
2. Touch the <Username:> text box. This will launch the “Enter Username” alpha-numeric keypad.
3. Using the keypad, enter the “operator” username.
4. Touch <OK> button after entering username.
5. Repeat steps 1-3 for entering “operator” for the password.
6. When both username a password are entered, touch the <OK> button on the “Login” screen. The Main Screen will be redisplayed with several more buttons enabled.



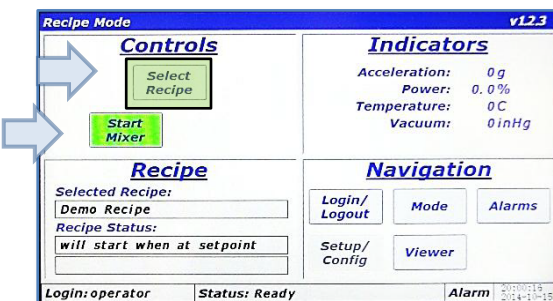
## 7.4 Select the Recipe

The *PharmaRAM™* II is provided with a demonstration recipe to use as a reference and guideline. The following demonstrates how to select a recipe for mixing using that demonstration recipe.

1. Touch the <Select Recipe> button. The “Select Recipe” screen is displayed.
2. Touch the line that displays “+ Demo Recipe Group.” This will expand the Demo Recipe Group and show the recipe(s) contained in that group. The demonstration recipe supplied with the *PharmaRAM™* II is called “Demo Recipe.”
3. Touch the line that displays “Demo Recipe.” A black arrow will appear to the left of the recipe selected. This black arrow indicates that the recipe has been selected.
4. Touch the <OK> button to return to the Main Screen.



5. The Main Screen will display the name of selected recipe in the “Recipe” pane, and the green <Start Mixer> button will also appear. Touch the <Start Mixer> button to initiate a mix cycle.

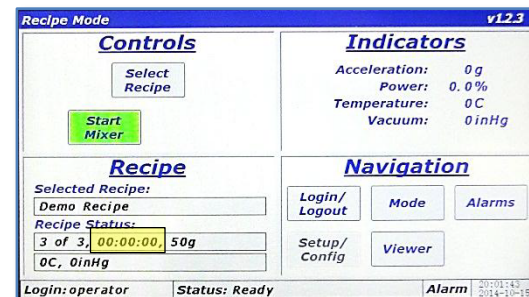
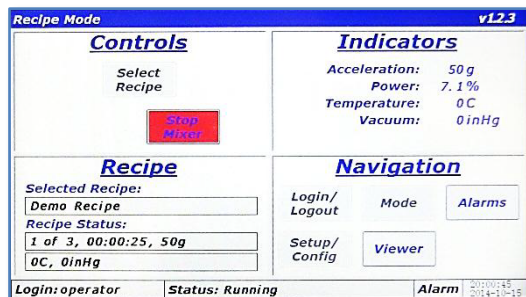
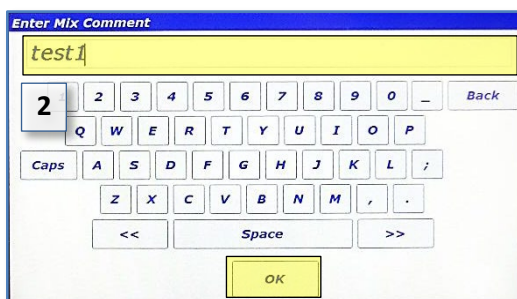
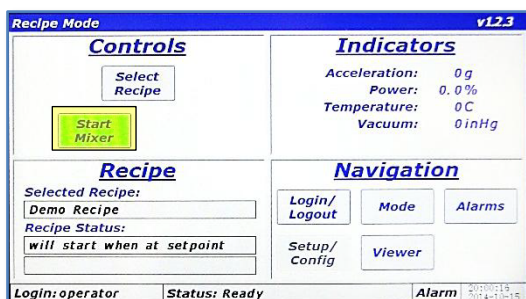


## 7.5 Run the Recipe

A recipe is a pre-defined mixing routine that runs the mixer at specific acceleration, vacuum, and temperature settings for defined periods of time.



1. Press the <Start Mixer> button to begin the mix cycle.
2. The “Enter Mix Comment” screen will appear. Enter a description of the mix or comment about the mixing routine to be performed, i.e., Batch #123, or Test #1. Use the keypad to enter mix comment.
3. After touching the <OK> button on the “Enter Mix Comment”, the actual accelerating/mixing will begin and the Main Screen will be displayed again. The <Start Mixer> button will change to the red <Stop Mixer> button on the Main Screen. The “Recipe” pane will update as the recipe executes by displaying the current segment, total segments, current segment timer, acceleration setting, temperature setting, and vacuum setting. Measured values will be displayed in the Indicators Pane.
4. When the final recipe segment’s timer counts down to 00:00:00, the mixer will stop. The <Stop Mixer> button will change to the <Start Mixer> button. This completes the recipe execution. Repeat the Demo Mix recipe for familiarization if necessary or required.



## 7.6 Completion

When the middle section of the Recipe Status Bar reads “Status: Ready”, the *PharmaRAM™* II’s doors can be opened and the mixing container can be removed.

1. Open the door
2. Remove the mixing container.
3. If no further mixes are required, turn the power switch to the off position.

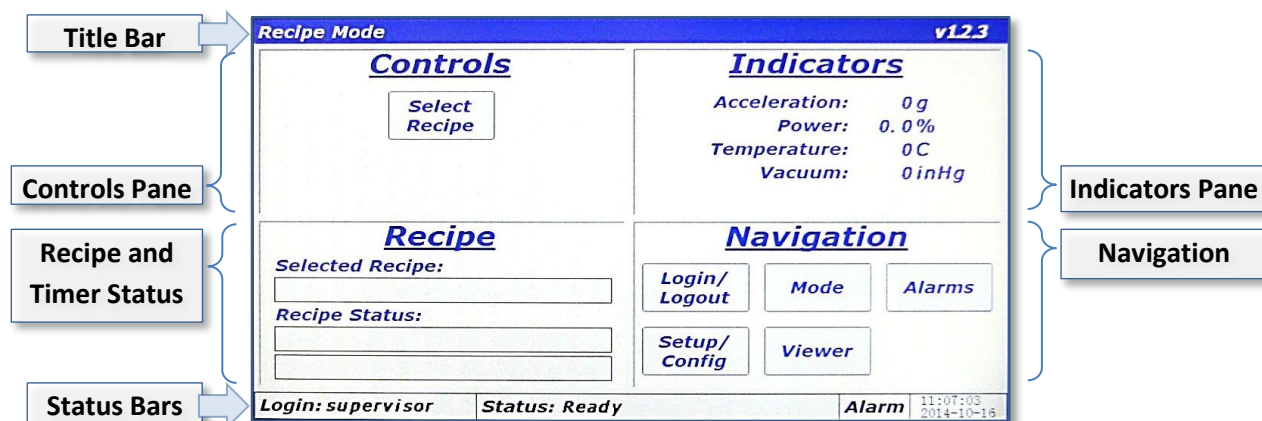
## 8 HMI (Human Machine Interface) – Overview

The HMI is the primary user interface. The *PharmaRAM™II* is completely digitally controlled and that control is provided by the HMI. All data entry and operations are provided through software keypads and buttons on the screen.

This section will cover the top-level features of the HMI operation, and the details of these topics will be described in subsequent sections.

### 8.1 Main Screen

The Main Screen is the primary screen for control of the *PharmaRAM™II*. Its appearance will vary depending on operating mode (Recipe or Auto), and machine operation status. The basic sections of the Main Screen are illustrated and described below.



- Title Bar – Displays mode and the firmware version
- Controls Pane – Area where the user Selects, Starts, and Stops recipes in Recipe Mode, or enters Set Points (Acceleration, Temperature, and Vacuum) in Auto Mode
- Indicators Pane – Contains the value of measured parameters
- Recipe and Timer Status Pane – Displays recipe and auto mode timer status
- Navigation Pane – Buttons for screen navigation
- Status Bar – Displays current username, machine status message, alarm status, and date/time.

## 8.2 Login

As illustrated in the Quick Start section, in order to operate the *PharmaRAM™* II, user authentication (login) is required. Four different login privilege levels are provided to control access to machine features. The *PharmaRAM™* II is delivered with pre-configured users at each level of login for demonstration purposes. These logins are tabulated below. It is recommended to delete these users or change the passwords upon familiarization of their use, and establishing new ones.

Level	Username	Password
0	Operator	Operator
1	Technician	Technician
2	Calibration	Calibration
3	Supervisor	Supervisor

Begin at The <Login/Logout> button in the “Navigation Pane.” Refer to the Quick Start section for screen procedures to log in. Detailed descriptions of available options, and features and definitions of the login levels can be found in Section 9 HMI Operation – Security and Login.

## 8.3 Operational Modes (Recipe and Auto)

The *PharmaRAM™* II is controlled through the use of two operating modes, Auto Mode and Recipe Mode. Recipe Mode should be the primary mode used by operators, while Auto Mode is used by advanced users to characterize a mixing process for eventual recipe programming. Level 0 (operator level) can be locked out of Auto mode.

The <Mode> button in the “Navigation Pane” allows switching between operational modes. Note that operational modes cannot be changed while the *PharmaRAM™* II is accelerating/mixing.

## 8.4 Alarming

Several operational parameters are monitored in the *PharmaRAM™* II to protect the equipment and the user. If the safe bounds of any of these parameters are exceeded, or the equipment is operated incorrectly, an Alarm will be triggered and the mixer will stop. The Status Bar has a field that reads “Alarm.” In an alarm condition, this field will turn red for a shutdown alarm or yellow for a warning alarm.

The <Alarms> button in the “Navigation Pane” allows viewing of alarms in a tabular format for review, and acknowledging alarms to clear them.

## 8.5 Setup and Configuration Screens

The Setup and Configuration screens are accessed with the <Setup/Config> button. This screen set allows setting customizable options, viewing critical machine parameters, data management, recipe creation, and calibration.

The Level 0 (operator) login level does not have any access to the Setup and Configurations screen set, while other levels have varying access to features. The breakdown of feature access is defined in Section 9.1 Login Levels and Privileges.

## **8.6     *Viewer***

All measured parameters including acceleration, power, frequency, temperature, and vacuum are plotted in a time-history format in the Viewer screen. The Viewer screen is accessed via the <Viewer> button in the “Navigation Pane. Please see Section 12 HMI Operation – Viewer for detailed description and instructions.



## 9 HMI Operation – Security and Login

To protect the *PharmaRAM™* II from unauthorized use and to maintain a record of which users operated the mixer, the system uses a user authentication system. Users are required to enter a username and password before operating the mixer. If the machine is not running and no user interaction with the HMI is detected for 10 minutes, then the current user will be automatically logged out.

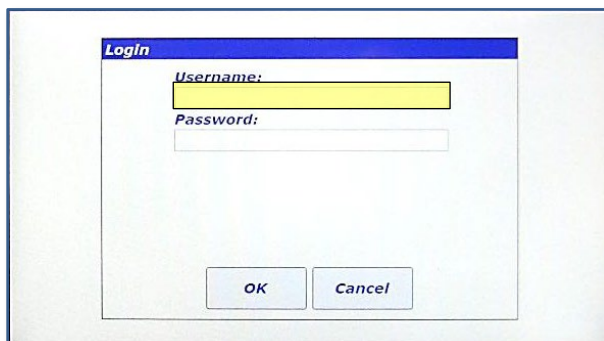
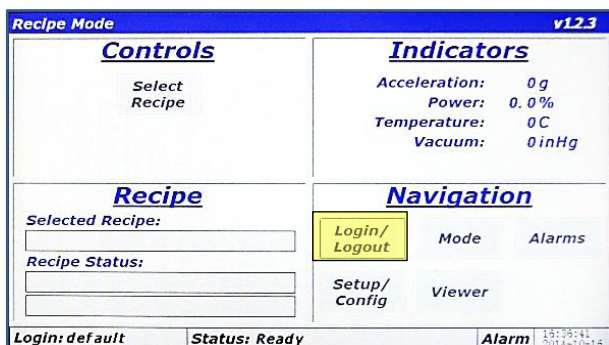
### 9.1 Login Levels and Privileges

The following table summarizes the different login levels and their associated privileges.

Level	Name	Privilege Description
3	Supervisor	Highest level of access Instrument calibration Status viewing for troubleshooting User creation/maintenance Date/time setting Recipe creation Optional feature configuration Data file management Recipe Mode operation Auto Mode operation
2	Calibration	Instrument calibration Status viewing for troubleshooting Recipe Mode operation Auto Mode operation
1	Technician	Status viewing for troubleshooting Recipe Mode operation Auto Mode operation
0	Operator	Lowest level of access Recipe Mode operation Optional Auto Mode operation

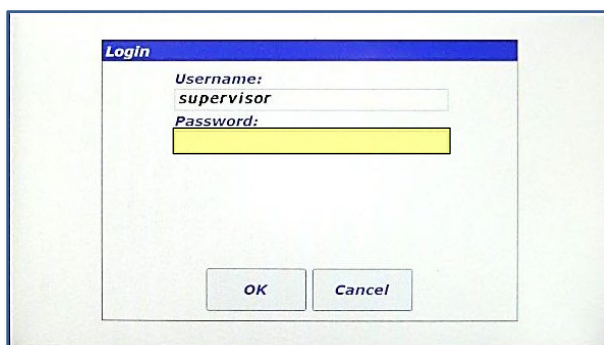
## 9.2 Screen Operations - Logging In/Out

The following table outlines the steps for logging in using the pre-configured supervisor login.



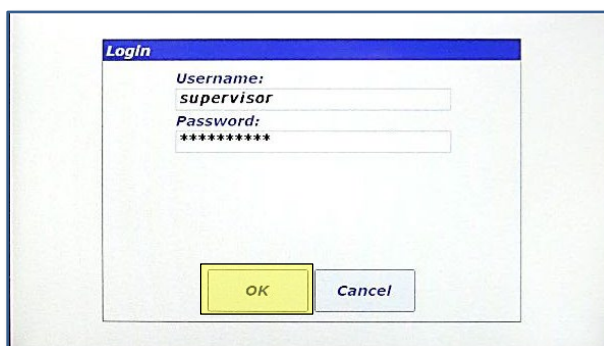
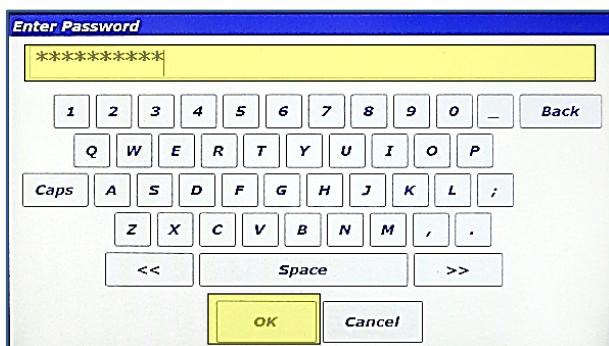
1. Touch the <Login/Logout> button

2. The "Login" screen will appear. Touch the textbox beneath "Username:."



3. Using the keypad, enter "supervisor" for the username. Touch the <OK> button when finished.

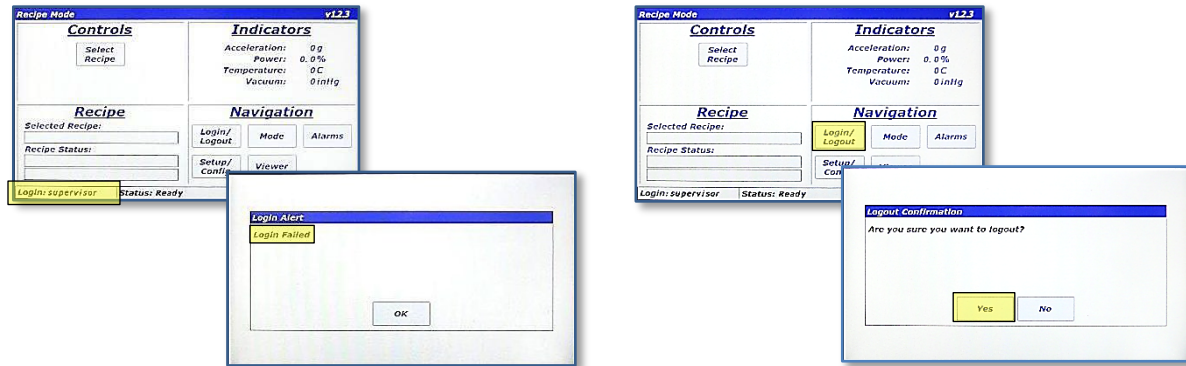
4. The "Login" screen will reappear and "supervisor" will be visible in the "Username:" textbox. Now, touch the "Password:" textbox to enter the password.



5. Using the keypad, enter "supervisor" for the password. Touch the <OK> button when finished.

6. The "Login" screen will reappear and "supervisor" will be visible in the "Username:" textbox and the asterisk masked password will also be visible. Touch OK to login.

[Type text]



7. If the login attempt is successful, image 1 above will be displayed and the "supervisor" username will be displayed in the lower left corner. If login is unsuccessful, a dialog will be displayed notifying the user (image 2 above).
8. To logout, simply touch the <Login/Logout> button again. A confirmation dialog box will appear. Touching yes on that dialog will log the current user out.

### 9.3 Log Files

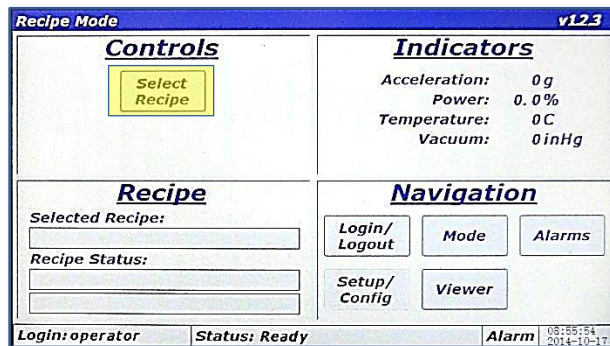
Every login attempt, successful or not, is logged to data files in the *PharmaRAM™II*'s memory. These files can be uploaded to a PC via USB for data archiving. See Section 13.8 Data Tab.

## 10 HMI Operation – Modes of Operation

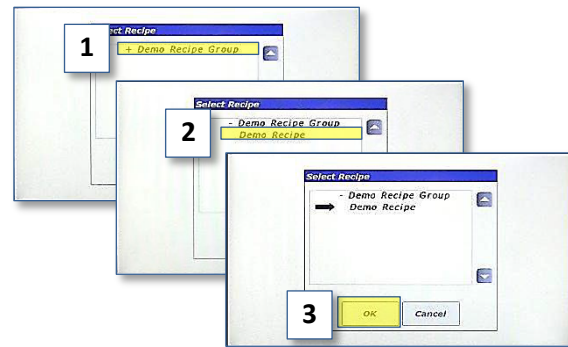
As previously noted, the *PharmaRAM™* II is controlled through the use of two operating modes, which are referred to as Auto Mode and Recipe Mode. Recipe Mode is the primary mode used by operators, while Auto Mode is used by higher levels to characterize a mixing process for eventual recipe programming. This section covers the details of the *PharmaRAM™* II in Recipe Mode and Auto Mode.

### 10.1 Screen Operations - Recipe Mode

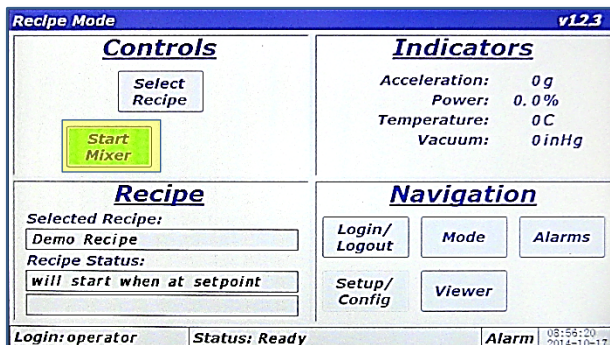
The following table details the steps for operating the *PharmaRAM™* II in Recipe Mode. Note that this sequence assumes the user has already logged in to the system.



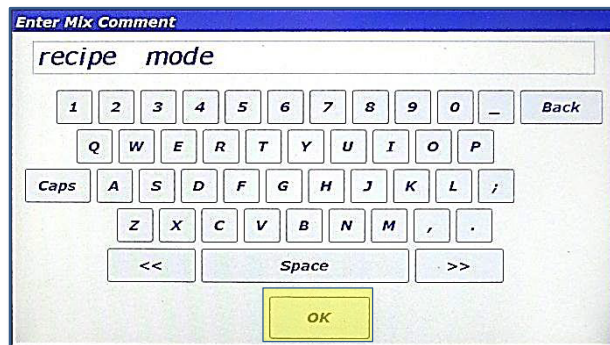
1. Touch the <Select Recipe> button.



2. Touch "Demo Recipe Group" (item 1) to expand the group. Touch "Demo Recipe" to select it (item 2). A black arrow will appear next to the recipe. Touch <OK> to load the recipe (item 3).



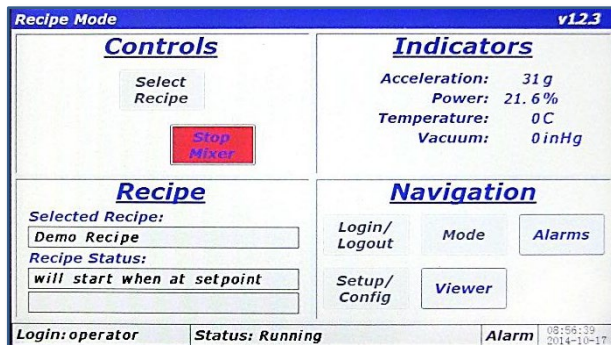
3. The main screen is displayed, and the <Start Mixer> button will be visible while the Recipe pane will display the name of the recipe just selected. Touch the <Start Mixer> button to begin the recipe mixing cycle.



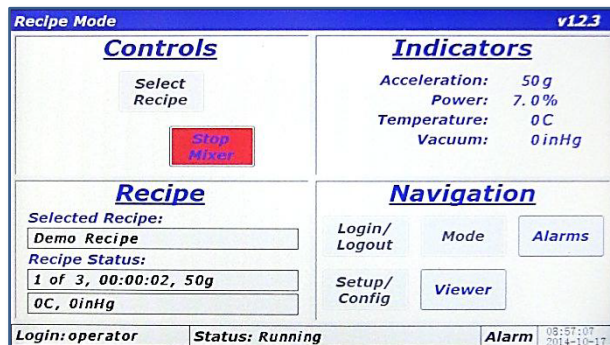
4. The "Enter Mix Comment" screen will appear. Enter a fitting description of the current mix being executed. The text entered in this screen is stored in a log file in the *PharmaRAM™* II's memory. Touch <OK> when finished.



[Type text]

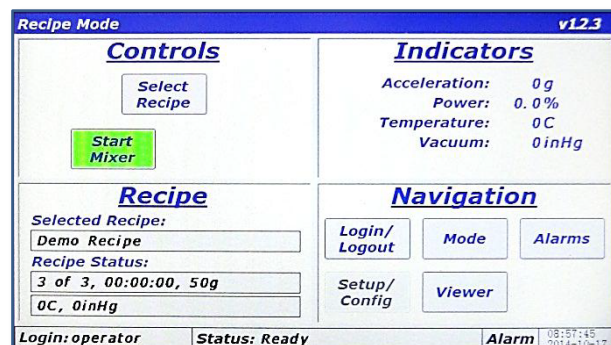


5. The Main Screen is again displayed, and the *PharmaRAM™* II will begin accelerating/mixing. The <Start Mixer> button changes to the <Stop Mixer> button. The recipe pane content will not update until the measured acceleration reaches the programmed setpoint. E.g., if the recipe calls for 60g of acceleration, updates will not start until acceleration reaches that 60g..

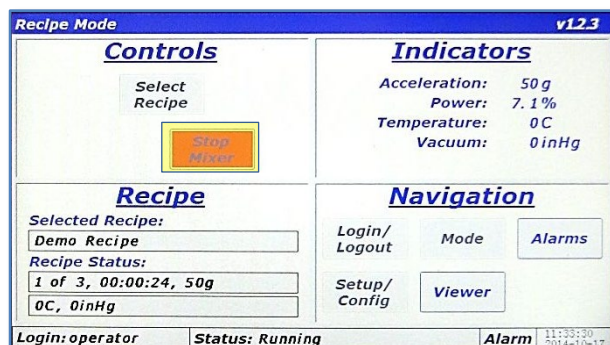


6. When acceleration reaches setpoint, the Recipe pane will update and display the currently executing segment, total segments, and remaining time on current segment, acceleration setpoint, temperature setpoint, and vacuum setpoint.

NOTE: If not equipped with temperature or vacuum control, the setpoints for these parameters will read 0C and 0inHg, respectively.

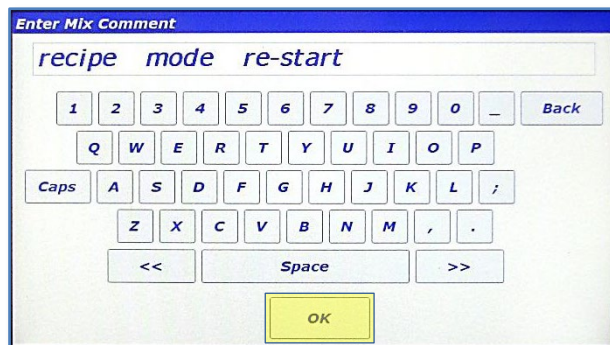
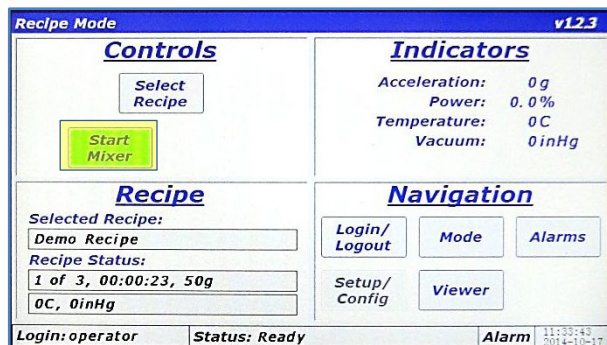


7. When the timer of the final segment expires, the mixer will stop. The <Stop Mixer> button changes to the <Start Mixer> button. This completes a full recipe mixing cycle.



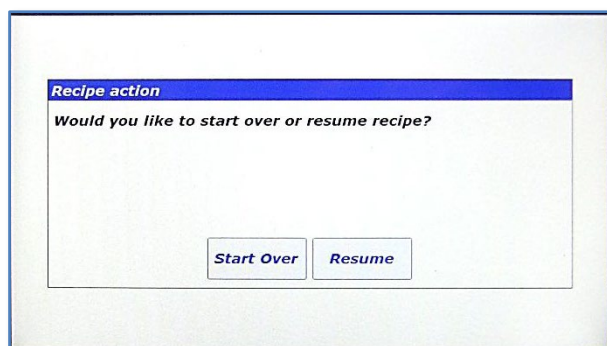
8. The *PharmaRAM™* II can be stopped by touching the <Stop Mixer> button during a recipe mix. Normally, this is only done if a user forgot to add an ingredient. Upon stopping the recipe, the timer will pause. To stop the mixer while running in Recipe Mode, simply touch the <Stop Mixer> button.

[Type text]



9. When the machine is stopped, the door can be opened and ingredients added (or the cause for stopping can be corrected). The *PharmaRAM™II* can then be restarted by touching the <Start Mixer> button.

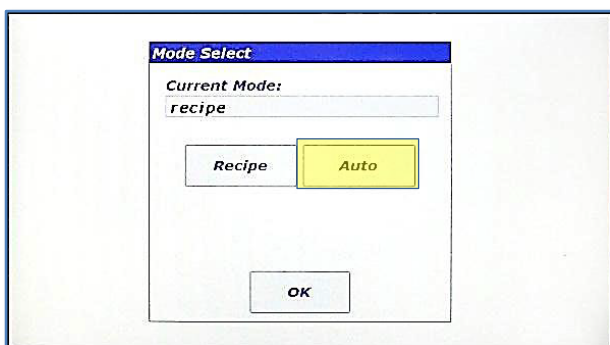
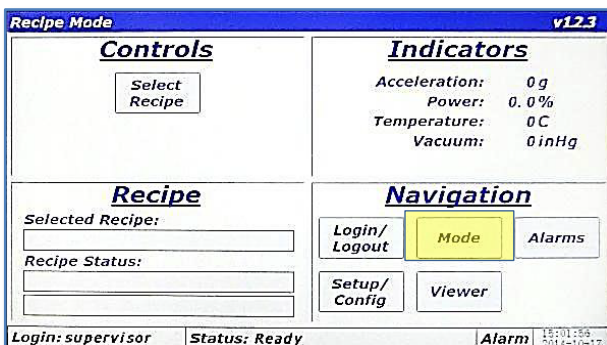
10. The “Enter Mix Comment” screen will appear again. Enter a fitting description. Touch <OK> when finished.



11. The *PharmaRAM™II* will give the option of starting from the beginning of the recipe by touching the <Start Over> button, or continuing from the point the mixer was stopped by touching the <Resume> button.

## 10.2 Screen Operations - Auto Mode

The following details the steps for operating the *PharmaRAM™II* in Auto Mode. Note that this sequence assumes the user has already logged in to the system with authorized login credentials to operate in Auto Mode.



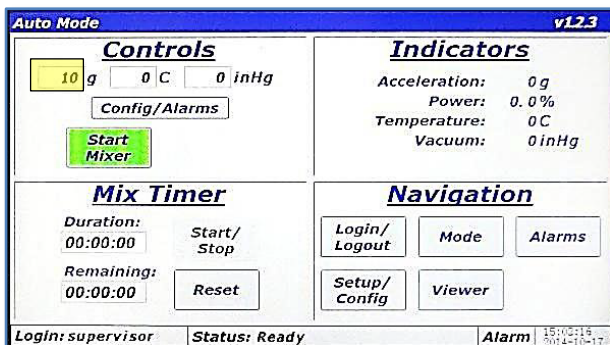
1. Touch the <Mode> button.

2. The “Mode Select” dialog is displayed. Touch the <Auto> button to change from Recipe to Auto Mode.

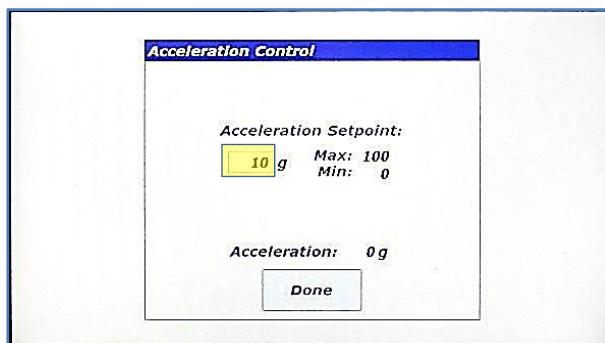
[Type text]



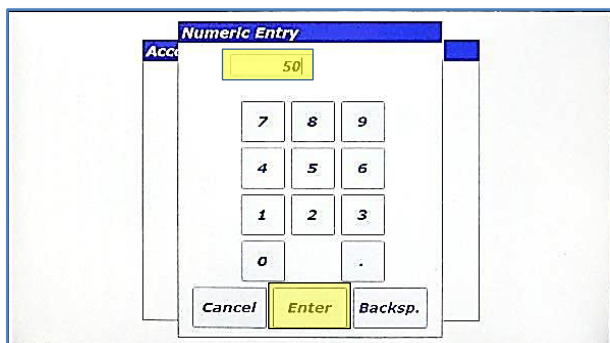
3. Touch the <OK> button to close the "Mode Select" dialog.



4. The Main Screen will appear, but will look differently in Auto Mode than it did in Recipe Mode. The Controls Pane now has three textboxes that are used to enter setpoints for acceleration (in g), temperature (in C), and vacuum (in inHg). The <Config/Alarms> button is used for entering user limits for certain parameters and will be discussed later. The <Start Mixer> and <Stop Mixer> buttons operate the same as Recipe Mode. The lower left pane is now titled "Mix Timer" instead of "Recipe." The "Mix Timer" is used to enter and operate the timer for Auto Mode. To update the acceleration setpoint, touch the textbox next to "g."



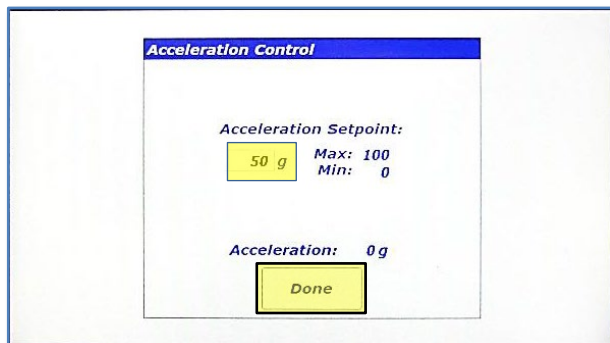
5. The "Acceleration Control" dialog will appear. The acceleration setpoint can be entered in this dialog. The entered value for acceleration must lie between these maximum and minimum values or the entry will not be accepted. To change the acceleration setpoint, touch the textbox next to "g."



6. A numeric keypad will appear. Enter the new setpoint value and touch the <Enter> button to close the keypad.

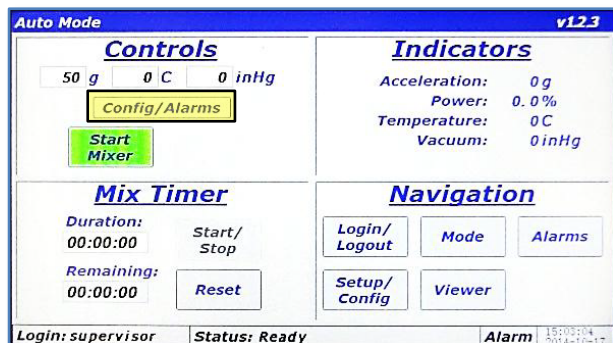


[Type text]

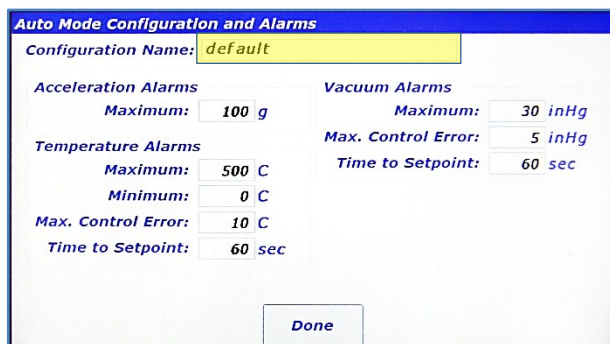


7. The newly entered setpoint will now appear in the textbox. Touch <Done> to close the “Acceleration Control” dialog.

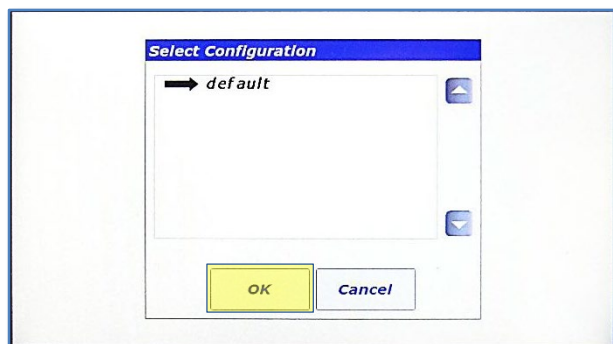
NOTE: If the *PharmaRAM™II* is mixing or in acceleration, the setpoint would be used as soon as a valid setpoint was entered. The *PharmaRAM™II* does not wait for you to touch <Done>.



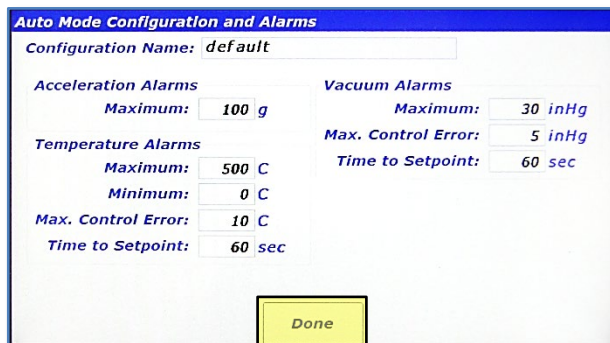
8. The new setpoint will now be updated in the Main Screen. To enter user-defined limitations and select a Configuration, touch the <Config/Alarms> button.



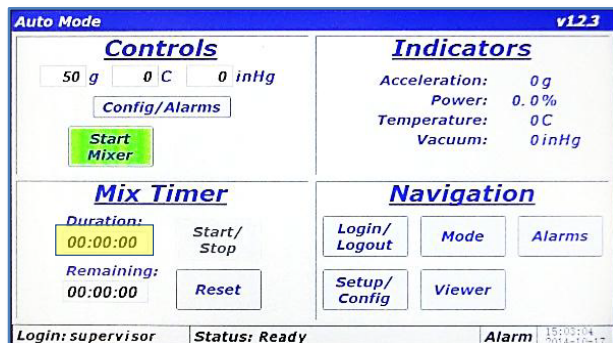
9. The “Auto Mode Configuration and Alarms” screen is displayed. This screen allows a user to enter limitations that will shut the machine down (and limit setpoint entry) if they are exceeded. If, for example, the material being mixed by the *PharmaRAM™II* was acceleration sensitive, the Maximum Acceleration could be limited in this screen. The Configuration for Auto Mode is selected by touching the textbox next to “Configuration Name:.”



10. The “Select Configuration” dialog will appear and the Configuration can be selected from the list (only one configuration is defined in the image). Touch <OK> after the configuration has been selected.



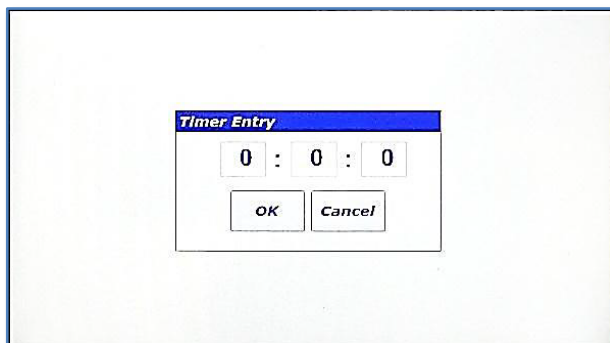
11. The “Auto Mode Configuration and Alarms” screen will be displayed again. To close the dialog touch <Done>.



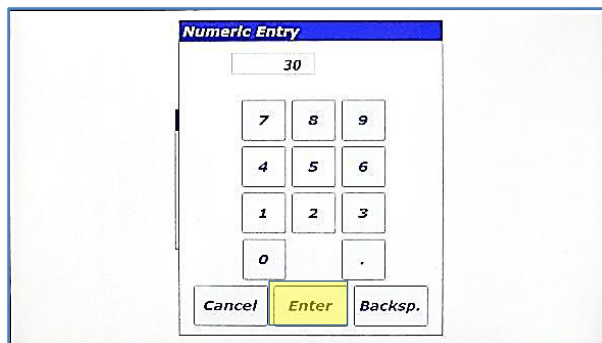
12. To enter a timer duration, touch the textbox under “Duration:” in the Mix Timer Pane.



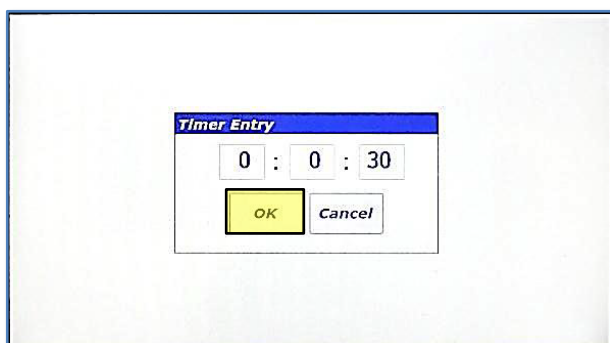
[Type text]



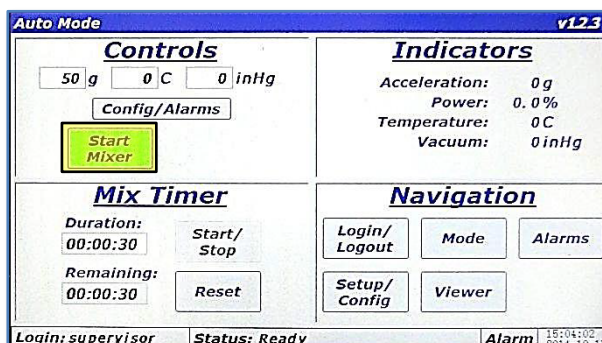
13. The "Timer Entry" dialog appears. The dialog has three textboxes, which are, going from left-to-right hours:minutes:seconds. Touch the right textbox to enter seconds.



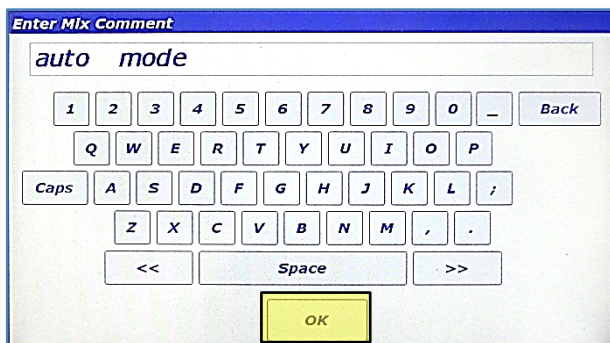
14. The "Numeric Entry" dialog will appear. Using the numeric keypad, enter 30 (for 30 seconds). Touch <Enter> when complete.



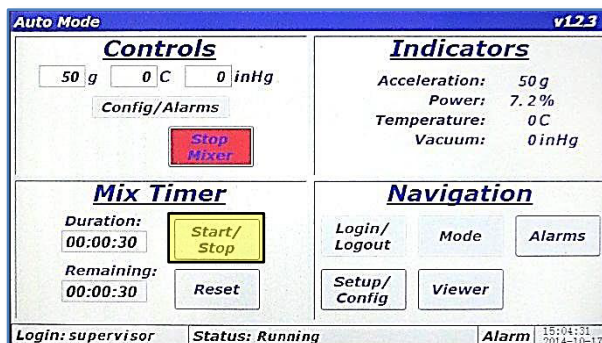
15. The entry from the previous step is displayed in the "Timer Entry" dialog. To edit hours and minutes, simply repeat the previous steps using the other textboxes. When complete, touch the <OK> button.



16. The timer value, 30 seconds in this case, will appear in the Mix Timer pane in the textboxes under "Duration:" and "Remaining:." Touch the <Start Mixer> button to begin a mix cycle in Auto Mode.

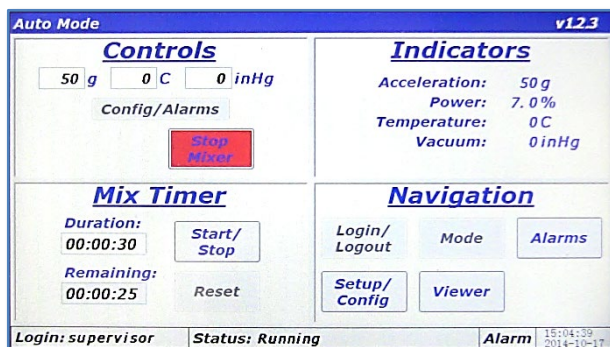


17. The "Enter Mix Comment" screen will appear. Enter a fitting description of the current mix. The text entered in this screen is stored in a log file in the PharmaRAM™II's memory. Touch <OK> when finished.

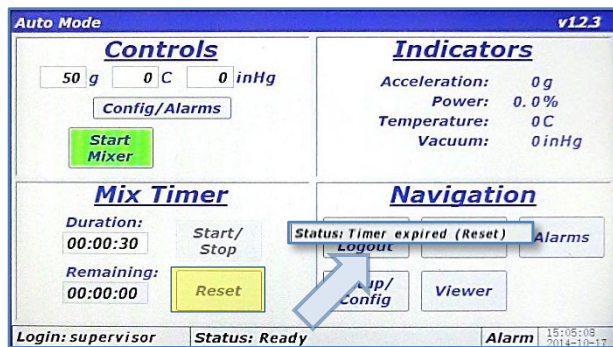


18. The Main Screen is again displayed and the PharmaRAM™II will begin accelerating/mixing. The <Start Mixer> button changes to the <Stop Mixer> button. Depending on Auto Mode Timer mode configured, the timer may start immediately, it may start when the mixer is at acceleration setpoint, or not at all (manual). The factory default for this option is manual mode where the user must touch the <Start/Stop> to start the timer. Touch <Start/Stop> in the Mix Timer pane.

[Type text]



19. When the timer is actually running the <Reset> button will be disabled. Also, the timer duration cannot be changed when the timer is running. Pressing the <Start/Stop> button will pause/stop the timer, which will re-enable the <Reset> button. If the <Reset> button is pressed, it will reload the timer to the initial value.



20. When timer expires, the *PharmaRAM™* II will stop accelerating/mixing. If the Auto Mode timer is set to the manual option, the middle portion of the Status Bar will read "Status: Ready." If the Auto Mode timer is set to the immediate or at-setpoint option, the middle portion of the Status Bar will read "Status: Timer expired (Reset)." If this message is visible, the <Start Mixer> button is hidden. The user must press the <Reset> button or load a new duration for the Auto Mode mix timer.

## 11 HMI Operation – Alarming

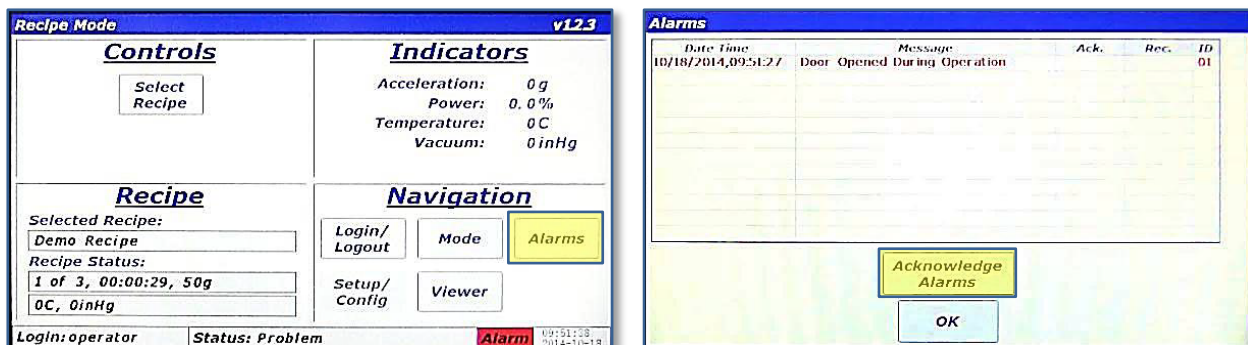
The *PharmaRAM™* II protects itself and the user by monitoring parameters that could cause damage or injury. When any of these parameters are violated, the mixer will stop accelerating/mixing and the user is notified at the Main Screen by a change in the color of the Alarm section of the Status Bar to red or yellow. Red indicates a shutdown error is present, and yellow indicates a warning is active.

The Alarm screen is accessed by touching the <Alarms> button from the Main Screen in the Navigation Pane. The Alarms screen provides a tabular format that shows when an alarm is posted, its message, when it recovered or the condition is corrected, when the alarm was acknowledged, and the alarm ID number.

Whenever an alarm is triggered, acknowledged, or recovered, a log file stored in the *PharmaRAM™* II's memory is updated. The alarm logs can be uploaded to a computer through USB. (See Section 13.8 for uploading instructions.)

### 11.1 Screen Operations - Alarms

The following details the steps for viewing and managing alarms.



1. When an alarm is active, the "Alarm" section of the Status Bar will turn red for a shutdown alarm and yellow for a warning. To view the alarm, touch the <Alarms> button.
2. The "Alarms" screen is displayed with the alarm message on the first line of the table. In this case, the "Door Opened During Operation" alarm has been triggered. This alarm is triggered if the *PharmaRAM™* II door is opened during a mixing cycle. Note that when an alarm is active and unacknowledged the alarm message will be red. The columns of the table are as follows:
  - Date Time: the date and time that the alarm was activated
  - Message: the alarm description
  - Ack.: the time that the alarm was acknowledged
  - Rec.: the time that the alarm was recovered
  - ID: alarm identification number

Touch the <Acknowledge Alarms> to acknowledge the alarm.

[Type text]

The screenshot shows the 'Alarms' screen with a table containing one active alarm. The text in the table is blue. Below the table are two buttons: 'Acknowledge Alarms' and 'OK'.

Date Time	Message	Ack.	Rec.	ID
10/18/2014,09:51:27	Door Opened During Operation	09:51:56		01

3. The alarm font turns blue and a time is inserted into the "Ack." Column. The blue color indicates an alarm that is still active but has been acknowledged. If the door is physically closed, the alarm will recover and the message will disappear from the alarm table.

The screenshot shows the 'Alarms' screen with an empty table. Below the table are two buttons: 'Acknowledge Alarms' and 'OK'.

Date Time	Message	Ack.	Rec.	ID
-----------	---------	------	------	----

4. The alarm message disappears when an acknowledged alarm recovers.

The screenshot shows the 'Alarms' screen with a table containing one recovered alarm. The text in the table is green. Below the table are two buttons: 'Acknowledge Alarms' and 'OK'.

Date Time	Message	Ack.	Rec.	ID
10/18/2014,09:52:22	Door Opened During Operation		09:52:27	01

5. If the alarm is recreated but the door closed (alarm recovered) before acknowledgment, the above alarm message will be displayed. Under this condition, the alarm message is green and the "Rec." column is populated with a time. If the <Acknowledge Alarms> is touched, the alarm message will disappear because it will be recovered and acknowledged.

The screenshot shows the 'Alarms' screen with an empty table. Below the table are two buttons: 'Acknowledge Alarms' and 'OK'.

Date Time	Message	Ack.	Rec.	ID
-----------	---------	------	------	----

6. The alarm message disappears when an acknowledged alarm recovers.

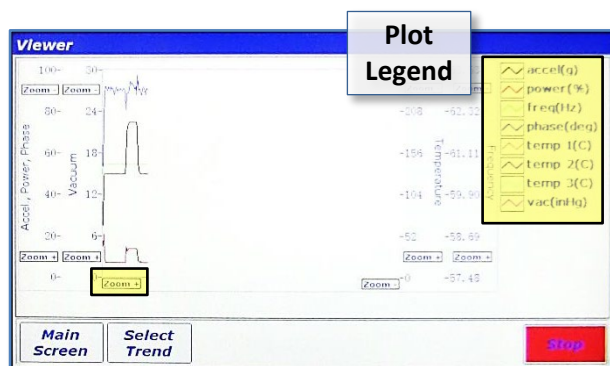
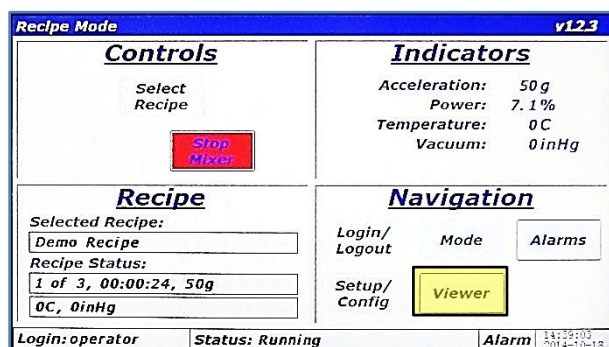


## 12 HMI Operation – Viewer

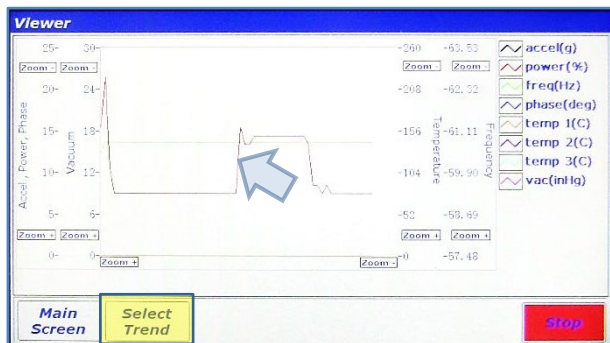
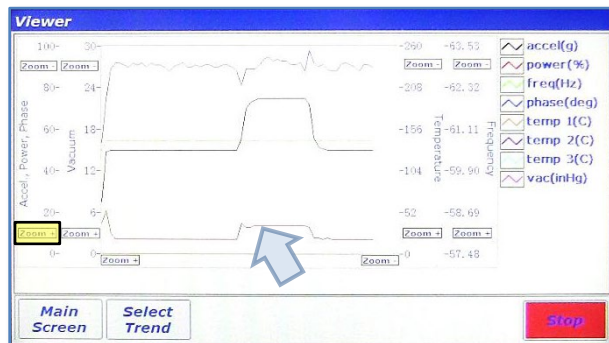
The *PharmaRAM™* II measures several parameters important to mixing efficiency. These measure parameters can be viewed in real-time as time-history plots. To view real-time plots, touch the <Viewer> button in the Navigation Pane of the Main Screen.

### 12.1 Screen Operations - Viewer

The following details the steps for viewing real-time measured parameters.

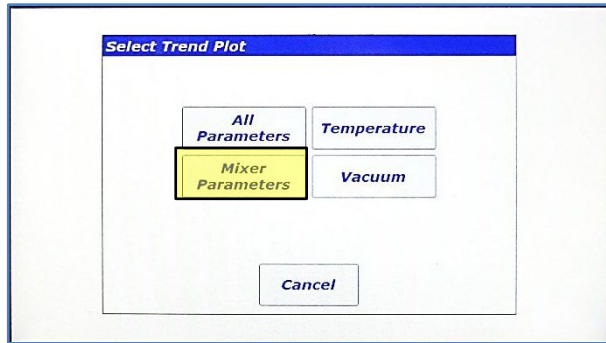


1. With the *PharmaRAM™* II mixing/accelerating in either Recipe or Auto Mode, touch the <Viewer> button in the Navigation Pane.
2. The “Viewer” screen will appear. This screen is a time-history plot of a maximum of eight parameters. The plot colors and names are located in the Plot Legend. Four Y-Axes have independent zooming capabilities. All plots share a single X-Axis zoom. To Zoom In on the X-Axis, touch and hold the <Zoom +> button on the X-Axis.

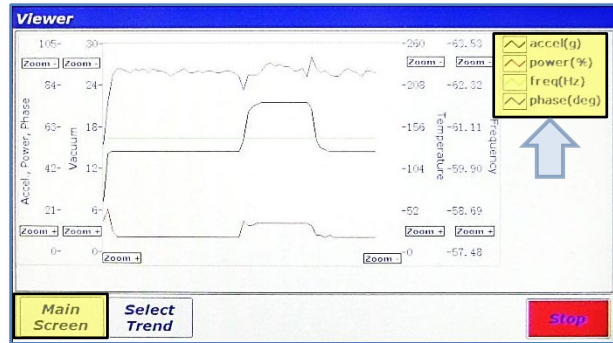


3. The visible plots will now have a shorter overall time, and will be “zoomed in.” Touching the <Zoom -> button will have the opposite effect. Zooming on the vertical Y-Axes uses the same method. To zoom in on the smaller “power(%)” plot, touch and hold the <Zoom +> button on the “Accel., Power, Phase” Y-Axis.
4. The smaller “power(%)” can now be examined more closely. To focus on a specific parameter of interest, pare down other visible parameters, touch the <Select Trend> button.

[Type text]



5. The "Select Trend Plot" dialog will appear. This dialog allows selecting the display of specific parameters. The buttons on this dialog will generate different versions of the graph displaying plots according to the button labels selected. Touching the <Mixer Parameters> displays only the four parameters related to mixing.

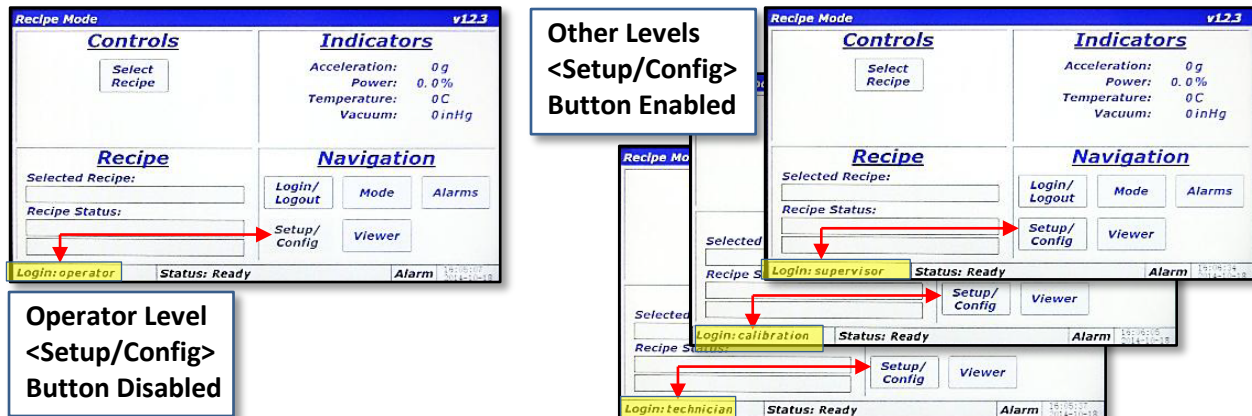


6. This image shows only the four mixer parameters in the plot as indicated by the contents of the Plot Legend. To return to the Main Screen, touch the <Select Trend>.



## 13 HMI Operation – Setup and Configuration

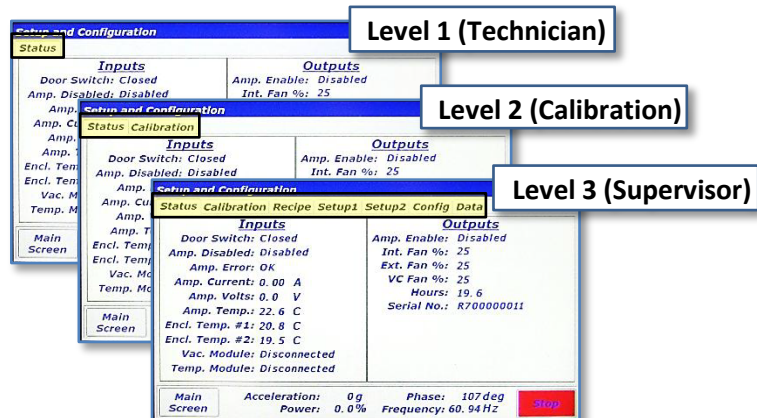
The *PharmaRAM™* II offers the user extensive customization and flexibility. The Setup and Configuration screen provides user control of optional features, and manages the configuration of the *PharmaRAM™* II. The Setup and Configuration screen is accessed by touching the <Setup/Config> button from the Main Screen. If logged in at Level 0 (operator), this button is *disabled*, while the button is *enabled* for all other login levels (refer to image), but the content of the Setup and Configuration screen is adjusted based on the user's login level.



The Setup and Configuration screen is laid out in a tabbed format, similar to many modern web browsers. Touching a tab title will switch between tabs. Tabs are visible based on the user's login level. The table to the right identifies the tabs and login level required to access those tabs. The associated image illustrates how the Setup and Configuration screen changes appearance based on login level.

Tab Name	Login Level Required		
	Status	Supervisor	Calibration
Status	Supervisor	Calibration	Technician
Calibration	Supervisor	Calibration	
Recipe	Supervisor		
Setup 1	Supervisor		
Setup 2	Supervisor		
Config	Supervisor		
Data	Supervisor		

**NOTE:** The following descriptions and instructions of the Setup and Configuration screen in Section 13 assume a Level 3 (Supervisor) login.



### 13.1 Status Tab

The Status Tab is used to examine machine parameters and perform diagnostics, if needed. The left portion of the tab is dedicated to machine **inputs** including switch and amplifier status, amplifier voltage/current, enclosure temperatures, and vacuum/temperature module communication status. The right portion of the tab is dedicated to machine **outputs** including amplifier enable command, fan speeds, machine hours and serial number.

The screenshot shows the 'Status' tab selected in the 'Setup and Configuration' window. The window has tabs for Status, Calibration, Recipe, Setup1, Setup2, Config, and Data. The Status tab is divided into two main sections: Inputs and Outputs.

Inputs	Outputs
Door Switch: Closed	Amp. Enable: Disabled
Amp. Disabled: Disabled	Int. Fan %: 25
Amp. Error: OK	Ext. Fan %: 25
Amp. Current: 0.00 A	VC Fan %: 25
Amp. Volts: 0.0 V	Hours: 19.6
Amp. Temp.: 22.6 C	Serial No.: R700000011
Encl. Temp. #1: 20.8 C	
Encl. Temp. #2: 19.5 C	
Vac. Module: Disconnected	
Temp. Module: Disconnected	

At the bottom of the window, there is a status bar with the following information: Acceleration: 0 g, Phase: 107 deg, Power: 0.0 %, Frequency: 60.94 Hz. There are also buttons for 'Main Screen' and 'Stop'.

### 13.2 Calibration Tab

The Calibration Tab is used to verify calibrations and to adjust calibration coefficients. Resodyn Acoustic Mixers provides calibration standards to calibrate the accelerometer. Procedures are provided with a Calibration Kit available from Resodyn. Accelerometer calibration should be performed annually. Vacuum and temperature can be calibrated with any standard systems used for that purpose.

The screenshot shows the 'Calibration' tab selected in the 'Setup and Configuration' window. The window has tabs for Status, Calibration, Recipe, Setup1, Setup2, Config, and Data. The Calibration tab is divided into three main sections: Accelerometer, Vacuum, and Temperatures.

Accelerometer	Vacuum	Temperatures
Acceleration: 0.0 g	Vacuum: 0.0 inHg	Temperature #1: 0.0 C
Calibration: 9.32	Calibration: 0.0	Calibration #1: 0.00
Zero: 1.10	Zero: 0.0	Zero #1: 0.00
		Temperature #2: 0.0 C
		Calibration #2: 0.00
		Zero #2: 0.00
		Temperature #3: 0.0 C
		Calibration #3: 0.00
		Zero #3: 0.00

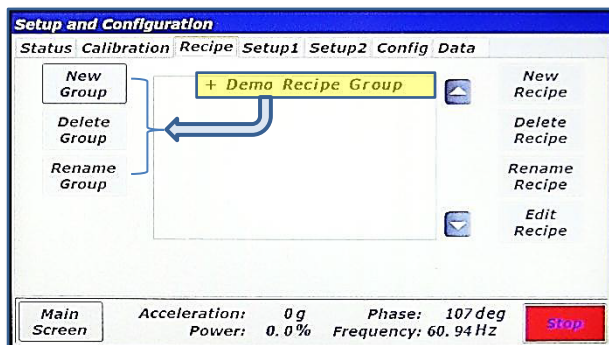
At the bottom of the window, there is a status bar with the following information: Acceleration: 0 g, Phase: 108 deg, Power: 0.0 %, Frequency: 60.94 Hz. There are also buttons for 'Main Screen' and 'Stop'.

### 13.3 Recipe Tab

The Recipe Tab is used to create and edit recipes and recipe groups. The *PharmaRAM*™II has the capability to store 10 recipe groups with 10 recipes per group, for a total of 100 recipes. Recipe groups can be thought of “folders,” and recipes are analogous to “files” on a computer. Recipe *Groups* can be created, renamed, and deleted in the recipe tab. Individual *Recipes* can be also be created, renamed, deleted, and edited from the recipe tab. The remainder of this section provides detail of recipe operations.

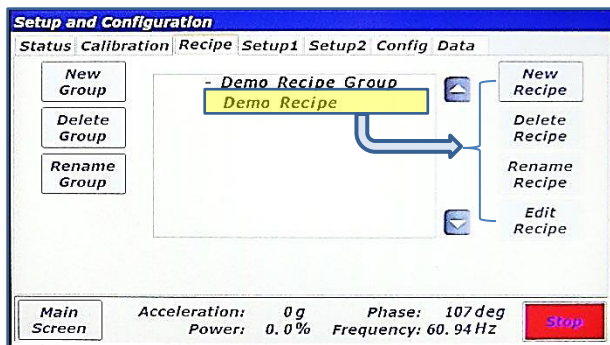
#### 13.3.1 Screen Operations – Edit an Existing Recipe

The following section details how to edit an existing recipe. The *PharmaRAM*™II is shipped with a demonstration recipe and group, used as the example to be edited below.

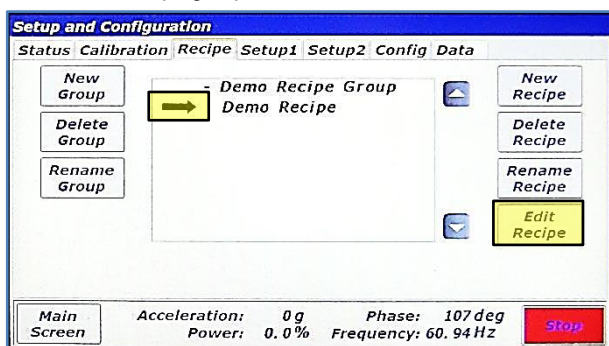


1. While in the Recipe Tab of the Setup and Configuration screen, touch the "+ Demo Recipe Group" line. This will expand the recipe group.

**NOTE:** The buttons on the left side of this tab are used for recipe *group* management, while the buttons on the right are used for *recipe* management. The buttons on both sides will change enabled/disabled state based on selection of recipe groups and recipes. In the image above, all of the buttons on the right are disabled because no recipe group or recipe is selected in the list. Only the <New Group> button is enabled on the left because no recipe group has been selected.

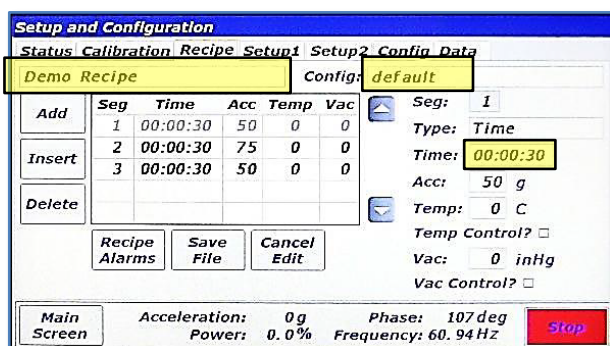


2. After expanding the "Demo Recipe Group", the "+" next to the group name changes to a "-" and the recipes in that group are listed. In this case, there is only one recipe listed named "Demo Recipe." Touch the line with the recipe.



3. After touching the recipe name, an arrow will appear indicating that the recipe has been selected. To view/edit the contents of this recipe touch the <Edit Recipe> button.

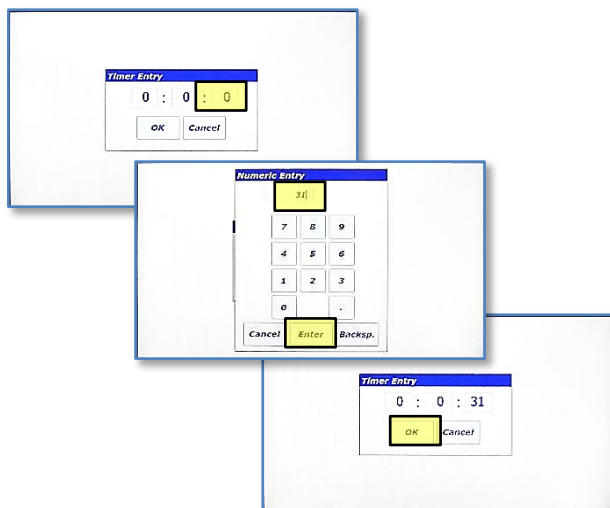
**NOTE:** The buttons on both sides are now enabled because a recipe group and recipe are expanded and selected, respectively.



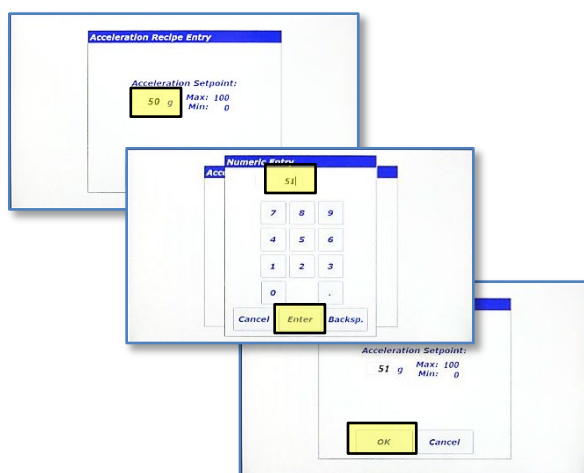
4. The recipe contents will be read from the *PharmaRAM™* II's memory and displayed in the screen shown above. The recipe name (*Demo recipe*) is displayed in the top-left textbox. The Configuration associated with this recipe (default) is displayed in the top-right textbox. The <Add>, <Insert>, and <Delete> buttons on the left side of the screen are used to add or remove segments to the recipe. The table in the middle of the screen shows already defined segments. The controls on the right side of the screen are used to change settings for time, acceleration, temperature, and vacuum. To demonstrate usage of these controls, the time for segment 1 will be changed from 30 seconds to 31 seconds, and the acceleration setpoint will be changed from 50g to 51g. Touch the textbox next time "Time:."

**NOTE:** Segments are time steps of the recipe. In the screen above, each row in the table is a segment.

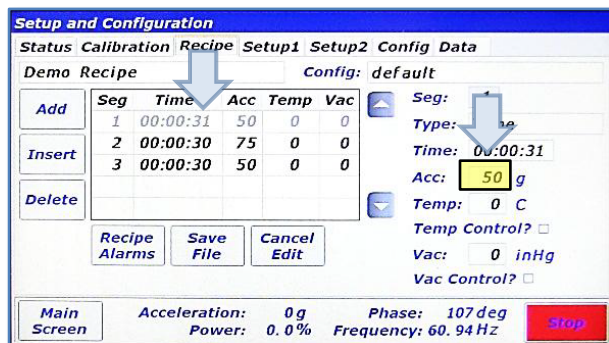
[Type text]



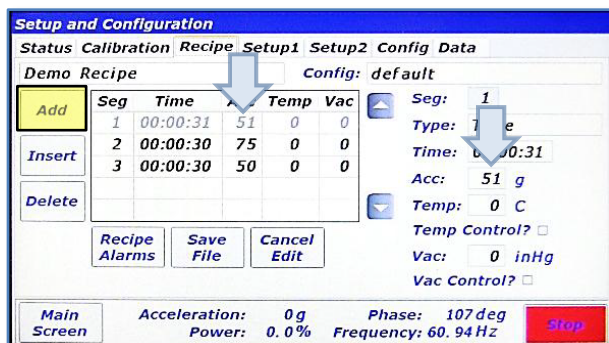
- The timer entry for recipe editing is the same as in Auto Mode. Touch the seconds textbox, enter 31 using the "Numeric Entry" dialog and then touch the <Enter> button. Touch OK in the "Timer Entry" dialog when complete.



- The "Acceleration Recipe Entry" dialog will appear. Use this dialog entry the same as the Auto Mode acceleration entry. Touch the textbox and enter 51 using the "Numeric Entry" dialog and then touch the <Enter> button. When complete, touch the <OK> button.



- The time for segment 1 is now 31 seconds. To update the acceleration setpoint from 50g to 51g, touch textbox next to "Acc:."



- The new setpoint of 51g now appears in the table and in the control on the right-side. Temperature and vacuum setpoints can be entered in the same fashion, if these the *PharmaRAM™* II is equipped with these options. Touch the <Add> button on the left-side of the screen to *append* a segment to the *end* of this recipe.



**Setup and Configuration**

Status Calibration Recipe Setup1 Setup2 Config Data

Demo Recipe Config: default

Seg	Time	Acc	Temp	Vac
1	00:00:31	51	0	0
2	00:00:30	75	0	0
3	00:00:30	50	0	0
4	00:00:00	0	0	0

Seg: 4  
Type: Time  
Time: 00:00:00  
Acc: 0 g  
Temp: 0 C  
Temp Control? ☐  
Vac: 0 inHg  
Vac Control? ☐

Recipe Alarms Save File Cancel Edit

Main Screen Acceleration: 0 g Phase: 107 deg Power: 0.0% Frequency: 60.94 Hz Stop

9. A new segment, segment 4, is now *added to the end* of this recipe. Using the methods previously described, this segment can be edited to have a time duration of 45 seconds and an acceleration setpoint of 45g, as shown on the following screen.

**Setup and Configuration**

Status Calibration Recipe Setup1 Setup2 Config Data

Demo Recipe Config: default

Seg	Time	Acc	Temp	Vac
1	00:00:31	51	0	0
2	00:00:30	75	0	0
3	00:00:30	50	0	0
4	00:00:45	45	0	0

Seg: 4  
Type: Time  
Time: 00:00:45  
Acc: 45 g  
Temp: 0 C  
Temp Control? ☐  
Vac: 0 inHg  
Vac Control? ☐

Recipe Alarms Save File Cancel Edit

Main Screen Acceleration: 0 g Phase: 107 deg Power: 0.0% Frequency: 60.94 Hz Stop

10. To add another segment between existing segments in the recipe, the <Insert> button will be used this time. Touch the <Insert> button to add another segment ahead of the selected segment. Since segment 4 is selected (light grey color), the new segment will become segment 4 and the old segment 4 will become segment 5, as shown in the next screen.

**NOTE:** The selected segment is a lighter grey color than the other segments. To select a different segment, touch the desired segment in the table control.

**Setup and Configuration**

Status Calibration Recipe Setup1 Setup2 Config Data

Demo Recipe Config: default

Seg	Time	Acc	Temp	Vac
1	00:00:31	51	0	0
2	00:00:30	75	0	0
3	00:00:30	50	0	0
4	00:00:00	0	0	0
5	00:00:45	45	0	0

Seg: 4  
Type: Time  
Time: 00:00:00  
Acc: 0 g  
Temp: 0 C  
Temp Control? ☐  
Vac: 0 inHg  
Vac Control? ☐

Recipe Alarms Save File Cancel Edit

Main Screen Acceleration: 0 g Phase: 107 deg Power: 0.0% Frequency: 60.94 Hz Stop

11. To edit the contents of the new segment 4, use the methods previously described. This segment is edited to have a time duration of 35 seconds and an acceleration setpoint of 35g, as shown in the next screen.

**Setup and Configuration**

Status Calibration Recipe Setup1 Setup2 Config Data

Demo Recipe Config: default

Seg	Time	Acc	Temp	Vac
1	00:00:31	51	0	0
2	00:00:30	75	0	0
3	00:00:30	50	0	0
4	00:00:35	35	0	0
5	00:00:45	45	0	0

Seg: 4  
Type: Time  
Time: 00:00:35  
Acc: 35 g  
Temp: 0 C  
Temp Control? ☐  
Vac: 0 inHg  
Vac Control? ☐

Recipe Alarms Save File Cancel Edit

Main Screen Acceleration: 0 g Phase: 108 deg Power: 0.0% Frequency: 60.94 Hz Stop

12. The new segment 4 now has updated time and acceleration setpoint. Segment 2 will now be deleted. Touch the line that contains segment 2.

**Setup and Configuration**

Status Calibration Recipe Setup1 Setup2 Config Data

Demo Recipe Config: default

Seg	Time	Acc	Temp	Vac
1	00:00:31	51	0	0
2	00:00:30	75	0	0
3	00:00:30	50	0	0
4	00:00:35	35	0	0
5	00:00:45	45	0	0

Seg: 2  
Type: Time  
Time: 00:00:30  
Acc: 0 g  
Temp: 0 C  
Temp Control? ☐  
Vac: 0 inHg  
Vac Control? ☐

Recipe Alarms Save File Cancel Edit

Main Screen Acceleration: 0 g Phase: 107 deg Power: 0.0% Frequency: 60.94 Hz Stop

13. Segment 2 is now highlighted (light grey). Touch the <Delete> button on the left to delete segment 2.

**Setup and Configuration**

Status Calibration Recipe Setup1 Setup2 Config Data

Demo Recipe Config: default

Seg	Time	Acc	Temp	Vac
1	00:00:31	51	0	0
2	00:00:30	50	0	0
3	00:00:35	35	0	0
4	00:00:45	45	0	0

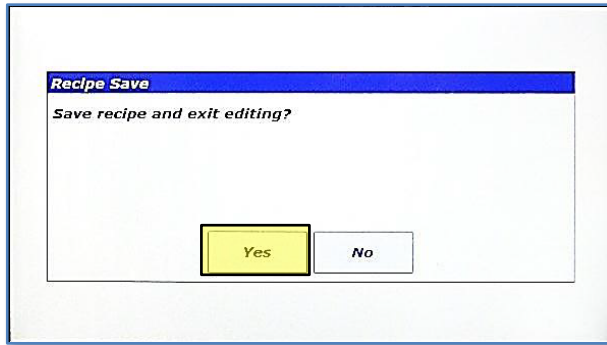
Seg: 2  
Type: Time  
Time: 00:00:30  
Acc: 50 g  
Temp: 0 C  
Temp Control? ☐  
Vac: 0 inHg  
Vac Control? ☐

Recipe Alarms Save File Cancel Edit

Main Screen Acceleration: 0 g Phase: 108 deg Power: 0.0% Frequency: 60.94 Hz Stop

14. The previous segment 2 is now deleted and the previous segments 3,4, and 5 are shifted up one position. To complete this recipe edit, touch the <Save File> button.

[Type text]



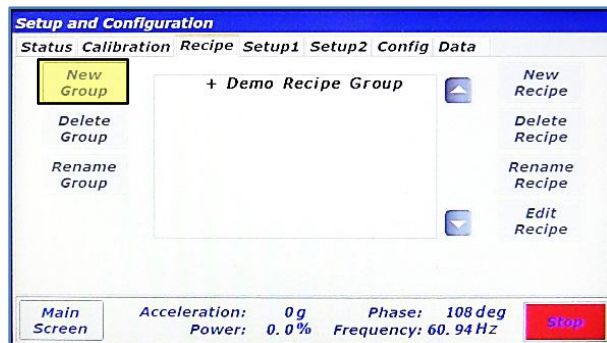
This concludes the “edit Recipe portion of Section 13.3.1.

The following section continues to assume Log In as a Supervisor

15. A confirmation dialog will appear. Touch <Yes> to save.

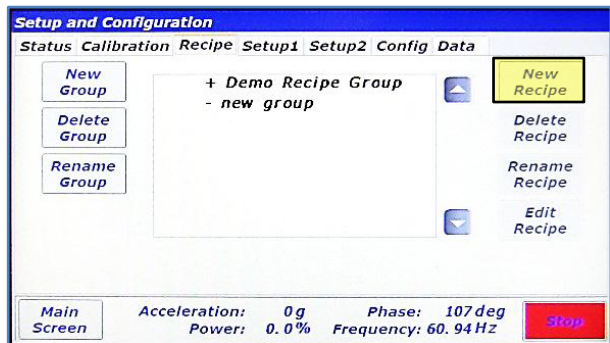
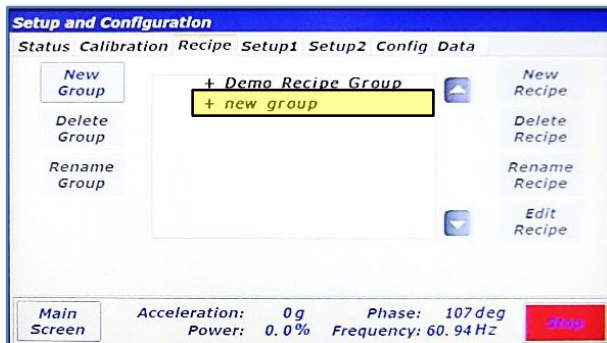
### 13.3.2 Screen Operations – Create New, Rename, and Delete

The following details how to create a new recipe group and then add a new recipe to that group.



1. To create a new recipe group, touch the <New Group> button.

2. Using the keypad enter the new group's name. Then touch <OK>.

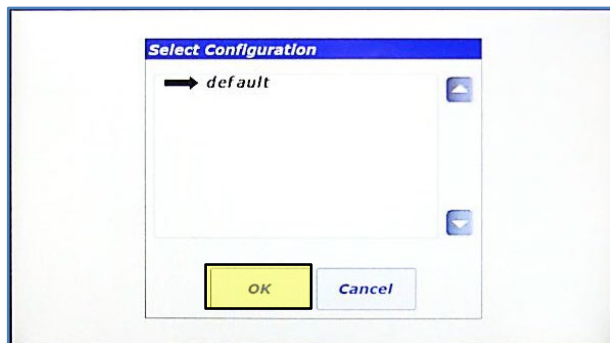


3. The new group will appear in the list. To add a recipe to this group, the group must be selected first. Touch the line with “+ new group”

4. The <New Recipe> button will now be enabled. Touch it to create a new recipe.



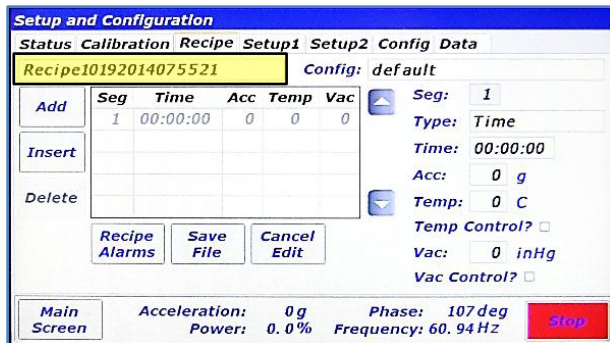
[Type text]



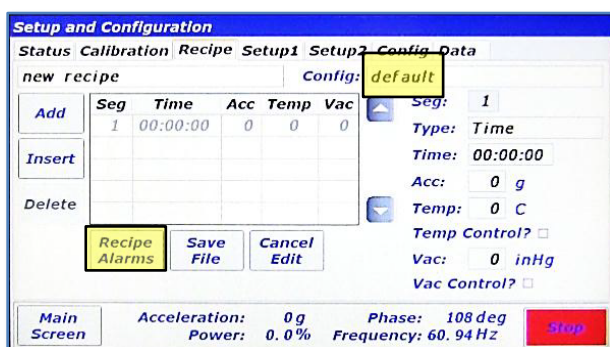
5. The "Select Configuration" dialog will appear. Configurations will be discussed in a later section. Touch <OK>.



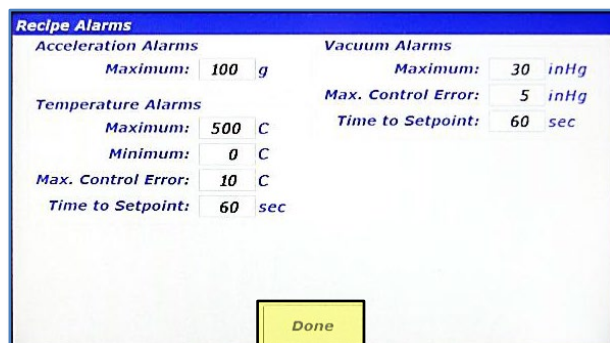
7. Rename the recipe and touch <OK>.



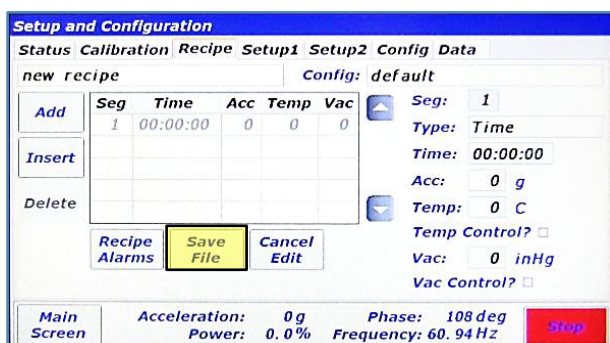
6. When a new recipe is created, a default name is given to the recipe. Also, a blank segment 1 is automatically added. To change the name, touch the textbox in the top-left hand corner.



8. If the configuration ever needs to be changed, touch the textbox next to "Config:." This will launch the "Select Configuration" dialog as seen in step 5. The "Type:" textbox is used for selecting the segment type. **NOTE:** Currently Time segments are the only option. This feature will be expanded in future firmware revisions or the *PharmaRAM™* II. Touch the <Recipe Alarms> button.

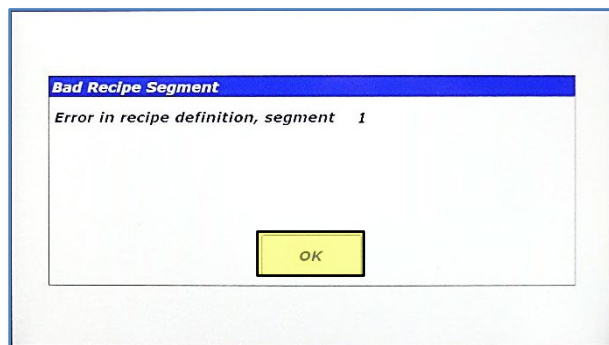


9. The "Recipe Alarms" screen will appear. This screen performs the identical function as the "Auto Mode Configuration and Alarms" but for Recipe Mode. This screen allows the user to enter limitations for the recipe. If for example, the material that will be mixed with this recipe was temperature sensitive, the Maximum temperature could be set here to protect the material from overheating. Touch <Done> when done entering alarm limits.

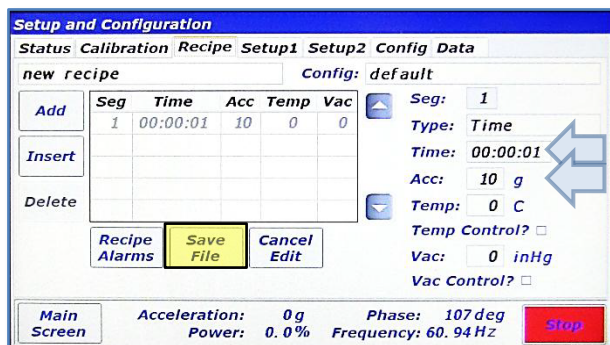


10. *PharmaRAM™* II will automatically check for input errors. To demonstrate the error checking functionality, touch the <Save File> button without editing the empty segment 1.

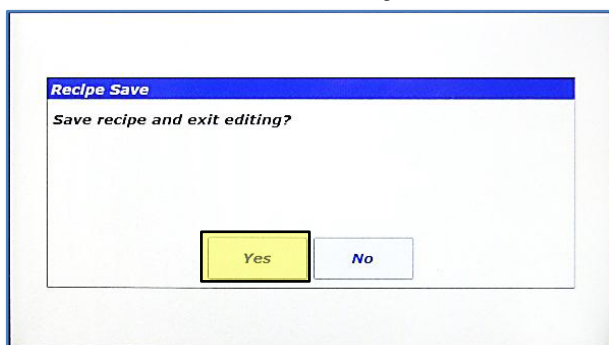
[Type text]



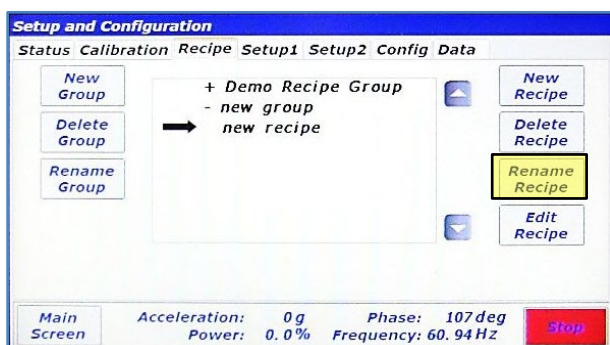
11. The "Bad Recipe Segment" dialog will appear and it specifies that something is wrong with the definition of segment 1. The time for segment 1 is 00:00:00, which is not allowed. Acceleration, temperature, and vacuum setpoints all need to lie between values entered in the "Recipe Alarms" as well to pass the error checking. Additionally, the setpoints are checked against fixture limits. Fixtures are discussed in a subsequent section. Touch <OK> to return to the editing screen.



12. Correcting the contents of the recipe by entering qualifying data allows saving. Touch <Save File>.



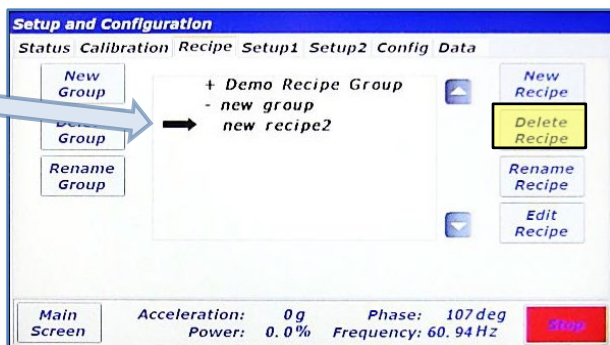
13. Now that the recipe is correct, the "Recipe Save" dialog appears. Touch <Yes>.



14. After expanding "new group", "new recipe" is visible. Select "new recipe" by touching its line. Recipes can also be renamed from this screen. Touch the <Rename Recipe> button on the right.

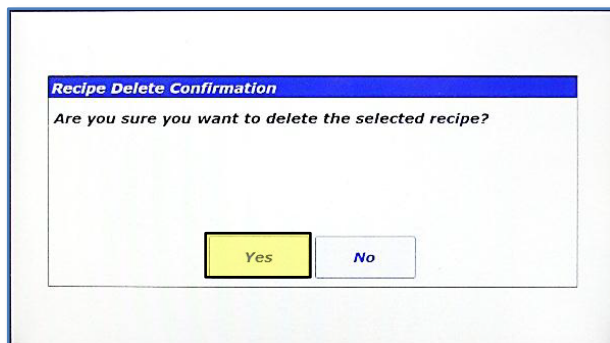


15. Rename the recipe and touch <OK>.

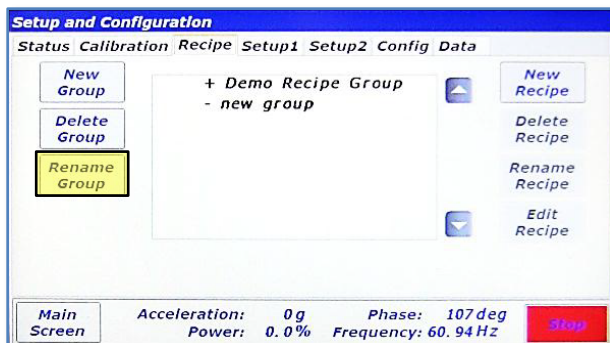


16. Recipes are also deleted from this screen. Select the renamed recipe and Touch the <Delete Recipe> button.

[Type text]



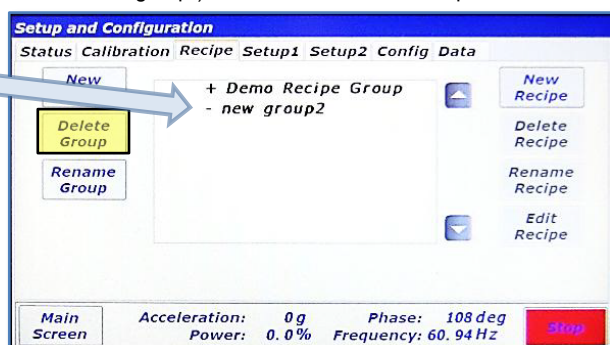
17. Touch <Yes> on the "Recipe Delete Confirmation" dialog to delete the recipe.



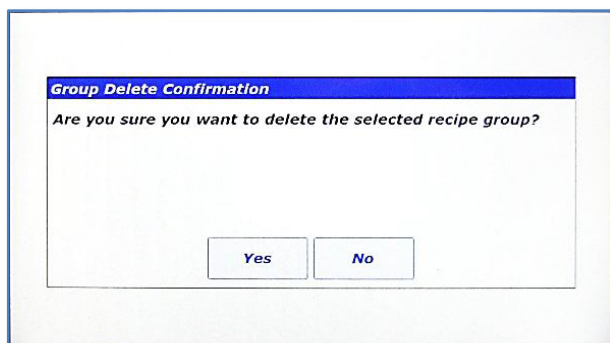
18. Selecting "new group" again will confirm that the recipe is deleted. Recipe Groups are also renamed and deleted from this screen. The process for this is identical to recipe renaming and deleting. With "new group" selected ("-" next to "new group"), touch the <Rename Group> button.



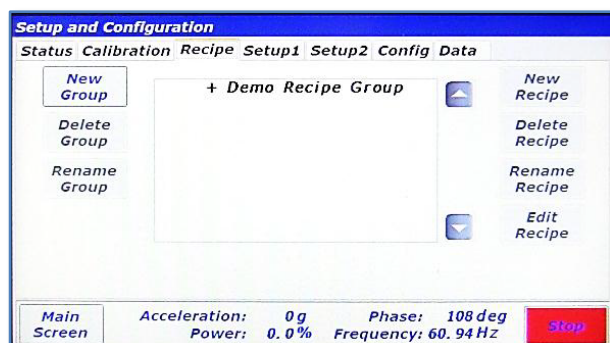
19. Rename the recipe group and touch <OK>.



20. The group has been renamed. To delete the new group, select it and touch the <Delete Group> button.



21. Confirm delete by touching <Yes> in the "Group Delete Confirmation" dialog.



22. The group has been deleted.



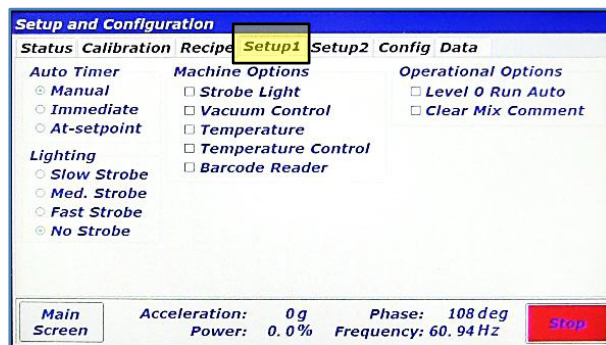
## 13.4 Setup1 Tab

The Setup1 Tab is used to configure optional features and enable machine options.

### 13.4.1 Auto Timer Group Box

This group box allows setting of the auto mode timer's behavior:

- **Manual:** Auto Mode timer starts only when user presses <Start/Stop>.
- **Immediate:** Auto Mode timer starts as soon as *PharmaRAM™II* starts mixing/accelerating.
- **At-setpoint:** Auto Mode timer starts as soon as *PharmaRAM™II* acceleration reaches initial setpoint.

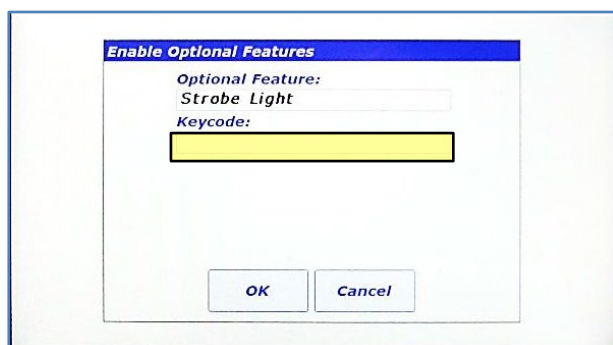
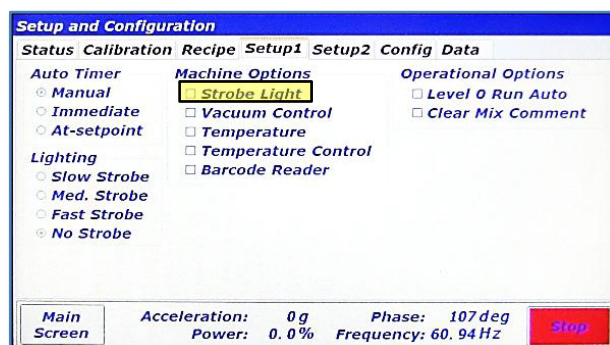


### 13.4.2 Lighting Group Box

This group box controls the behavior of the optional strobe light feature for the *PharmaRAM™II*. The controls in this group box will only be active if the *PharmaRAM™II* is equipped with the strobe option. The top three selections (<Slow Strobe>, <Med. Strobe>, <Fast Strobe>) adjust the strobe speed. The bottom selection, <No Strobe> sets the lighting to a fixed illumination. The <No Strobe> setting is the only allowed setting if the strobe light feature is not equipped.

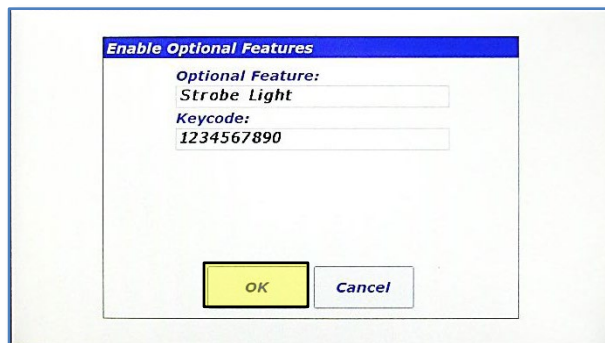
### 13.4.3 Machine Options Group Box

If a *PharmaRAM™II* user decides to enable features after initial purchase, a keycode will need to be entered to turn those features on. The Machine Options Group Box allows the user to enable optional features by entering a keycode. Additionally, this box indicates enabled features with a checked box. The following illustrates the process of enabling an optional feature.



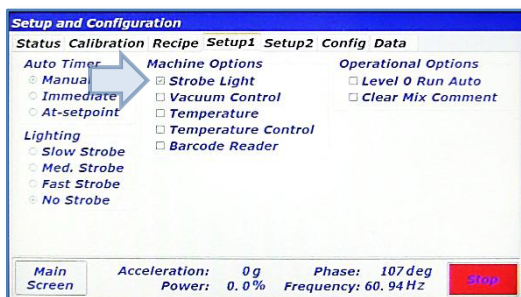
1. To enable the strobe light feature, touch the strobe light check box. Call Resodyn Acoustic Mixers to access a key code at 406-497-5333.
2. The "Enable Optional Features" dialog will appear. Touch the textbox under "Keycode:"

[Type text]



3. Enter the keycode provided by Resodyn Acoustic Mixers. Touch <OK> when complete.

4. Touch OK to attempt activation.



5. If activation is successful, then a checkbox will appear in front of the option. Otherwise, a failure dialog will appear.

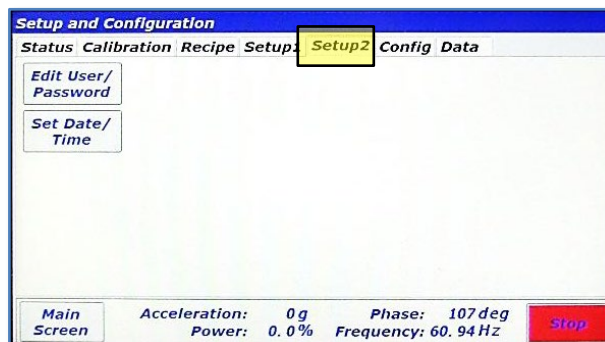
### 13.4.4 Operational Options Group Box

User preference options are located in the Operational Options Group Box. Currently, there are two options:

- **Level 0 Run Auto:** If this checkbox is checked, Level 0 (Operator) is allowed to operate the *PharmaRAM™* II in Auto Mode.
- **Clear Mix Comment:** By default, the previous Mix Log Comment is retained between a *PharmaRAM™* II shutdown and re-start. This can be useful if a specific comment protocol is required. Checking this option will clear the Mix Log Comment between starts and force the user to re-type the mix comment.

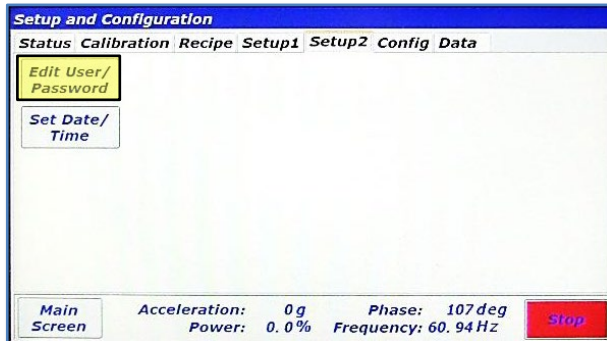
## 13.5 Setup2 Tab

Currently, only two buttons are present on the Setup2 Tab. The top button, <Edit User/Password> provides a user management utility to create new users, change passwords, and delete users. The <Set Date/Time> button is used to adjust the system date and time.

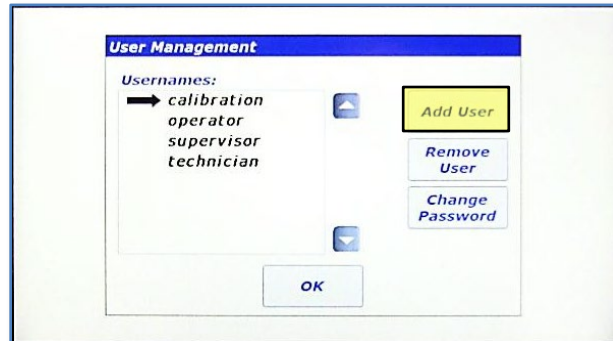


### 13.5.1 Screen Operations – User Management

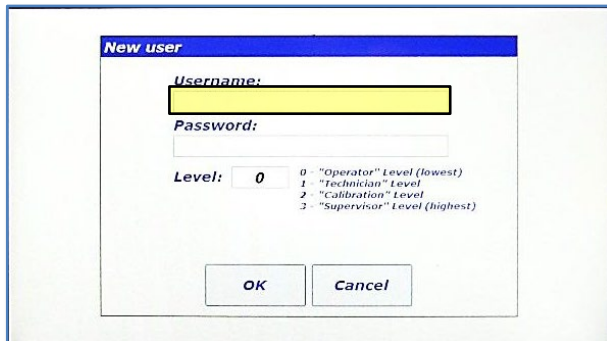
This details how to create a new Level 2 (Calibration) user login.



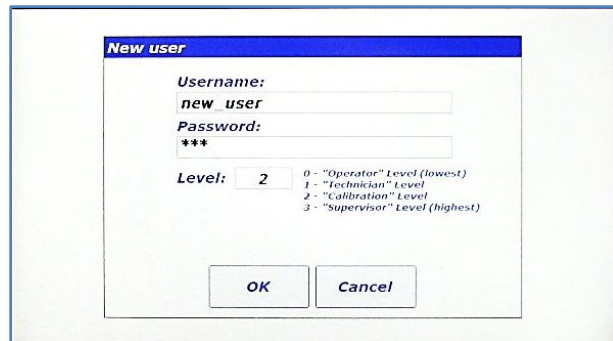
1. Touch the <Edit User/Password> button.



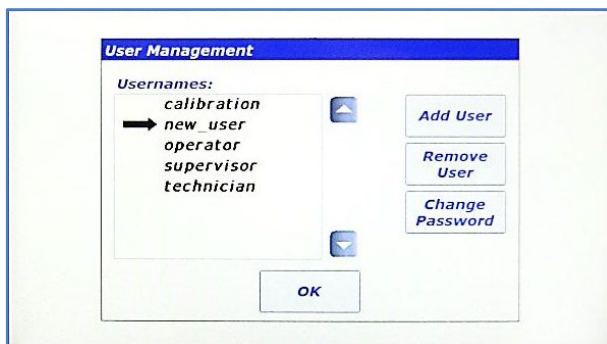
2. The "User Management" dialog appears. Touch the <Add User> button.



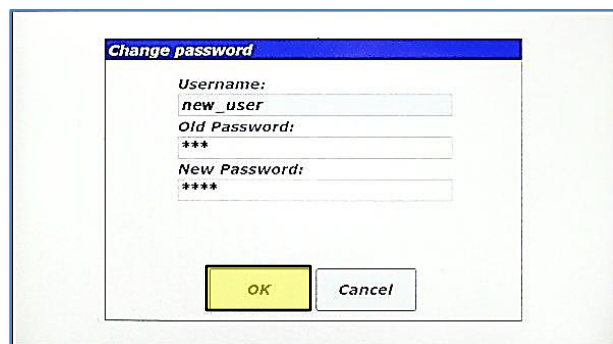
3. The "New User" dialog appears. Touch the "Username:" textbox to enter a new username.



4. Enter the new username and password using the same method as initial login and set the login level number according to the description in the dialog. In this case, a Level 2 (Calibration) login will be created. Touch <OK> to create the new user.



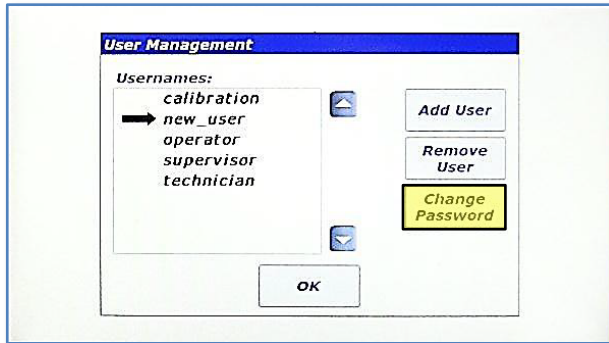
5. The new user has been created. To change the password created in Step 4, touch the <Change Password> button.



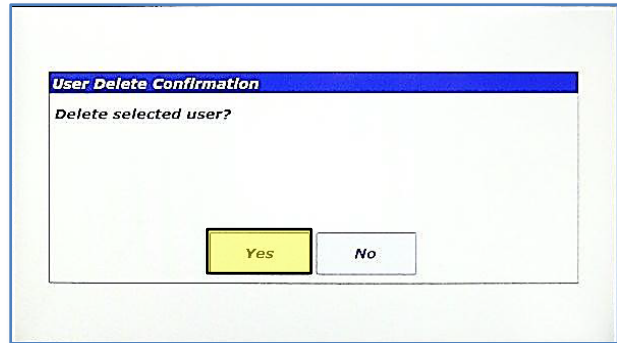
6. The "Change password" dialog will appear. Enter the old password from Step 4, and new password and then touch <OK>.



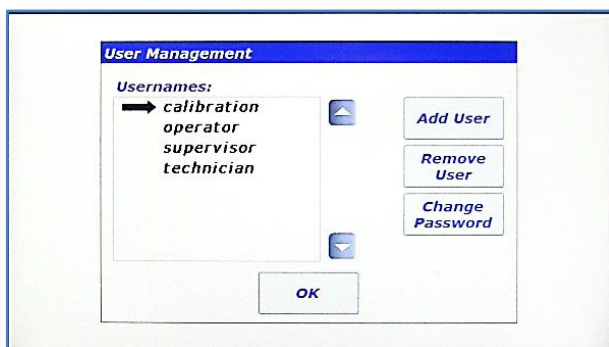
[Type text]



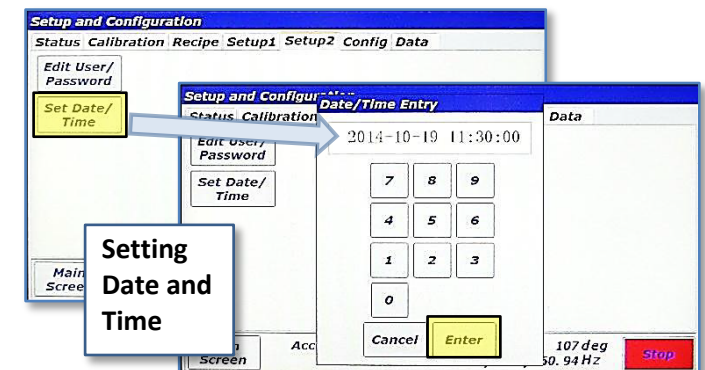
7. The password has been changed when the "User Management" dialog reappears. Otherwise, a failure dialog will notify the user of failed password change. To delete a user, select it, and touch the <Remove User>.



8. Confirm user delete by touching the <Yes> button in the "User Delete Confirmation" dialog.



9. The user has been deleted.



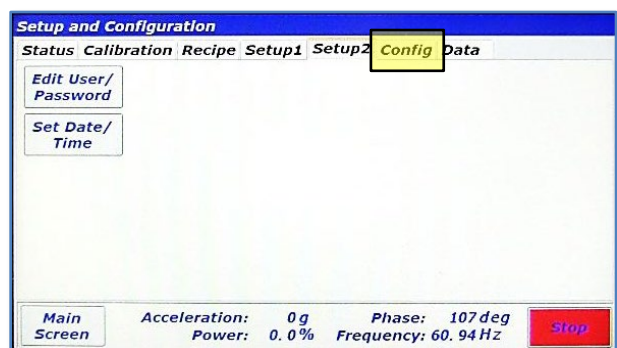
### 13.6 Setting Date and Time

Touch <Set Date/Time> on the Setup2 tab to set the system date and time. The entire date and time must be set for the update to work correctly. Date is entered in YYYY-MM-DD format and time is entered in 24 hour format, i.e., HH:MM:SS. Touch <Enter> when complete.

### 13.7 Config Tab

The Config Tab provides a method of enabling/disabling certain features of the machine. Temperature measurement can be de/activated as necessary to avoid alarm conditions that are not applicable to a mix setup. If a temperature sensor is not being used, its alarming functions must be shut off.

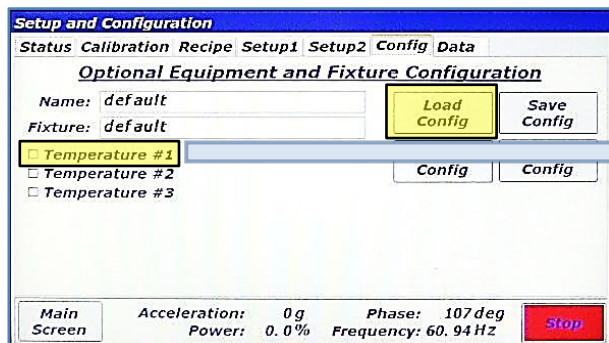
This tab also allows selection of configured fixtures (mix container and mix container holders) that provide necessary operating parameters and limitations of different fixtures.



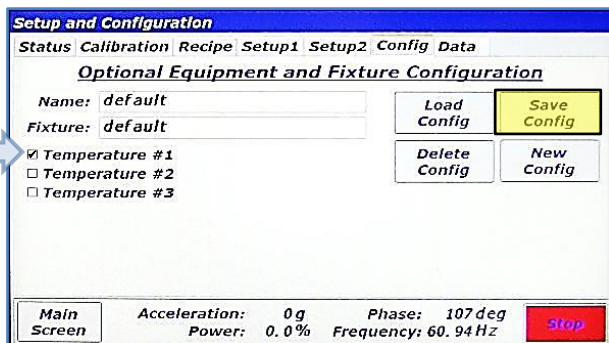
### 13.7.1 Screen Operations – Edit a Configuration

The following walk-through modifies the configuration provided with the *PharmaRAM™* II called “default.” This sequence assumes that temperature measurement option is equipped, and that temperature #1 was not used initially.

1. In the Config tab, touch the <Load Config> button.



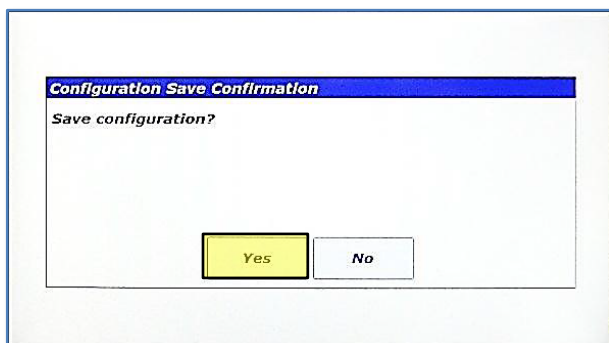
2. In the “Select Configuration” dialog, there is only one configuration defined, “default.” It is already selected. Touch <OK>.



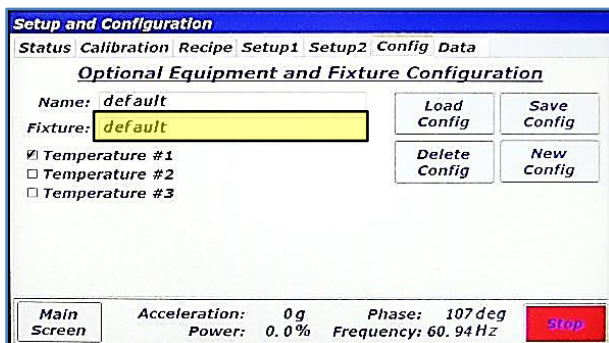
3. The “default” configuration is now loaded. Notice that none of the temperature checkboxes are checked. This means that in its current state, no temperature alarming would be active and all temperatures would read “0.” Turn on temperature #1 by touching it.

4. Temperature #1 is now checked. Touch the <Save Config> button to commit changes.

NOTE: The default configuration cannot be deleted, but it can be modified.



5. Touch <Yes> on the “Configuration Save Confirmation” dialog box.



6. Now that temperature #1 is checked and the default configuration saved, Temperature Channel #1 will be monitored and displayed. Additionally, all fixture and user temperature alarm limits will be activated. The name given to the original fixture shipped with the *PharmaRAM™* II is also referred to as “default.” A fixture contains operational parameters associated with a mix container holder and mix container. Fixture files define these parameters, and fixture files are created by Resodyn Acoustic Mixers and cannot be modified. But, they are viewable. Touch the textbox next to “Fixture:.”

[Type text]

**Fixture Definition/View**

Fixture Name: default

Part Number: 900684

Starting Frequency: 60.50 Hz

Maximum Frequency: 65.00 Hz

Minimum Frequency: 55.00 Hz

Maximum Acceleration: 100 g

Maximum Temperature: 500 C

Minimum Temperature: 0 C

Maximum Vacuum: 30 inHg

<< Done >>

- The "Fixture Definition/View" screen will appear. The parameters for the selected fixture are displayed. When new fixtures are ordered, fixture files will need to be installed on the mixer using the procedure accompanying the fixture. If the system has more than one fixture defined, the "<<" and ">>" buttons scroll through all of the fixture files. Touch <Done>.

### 13.7.2 Screen Operations – Create a Configuration

The following details the creation of a configuration that could be used without temperature by modifying the default configuration using temperature.

**Setup and Configuration**

Status Calibration Recipe Setup1 Setup2 Config Data

Optional Equipment and Fixture Configuration

Name:

Fixture: default

☐ Temperature #1

☐ Temperature #2

☐ Temperature #3

Load Config Save Config

Delete Config New Config

Main Screen Acceleration: 0 g Phase: 107 deg Power: 0.0% Frequency: 60.94 Hz Stop

**Enter New Configuration Name**

no temperature

1 2 3 4 5 6 7 8 9 0 - Back

Q W E R T Y U I O P

Caps A S D F G H J K L ;

Z X C V B N M , .

<< Space >>

OK Cancel

- Touch the <New Config> button.

- Enter a name for the configuration and touch <OK>.

**Setup and Configuration**

Status Calibration Recipe Setup1 Setup2 Config Data

Optional Equipment and Fixture Configuration

Name: no temperature

Fixture: default

☐ Temperature #1

☐ Temperature #2

☐ Temperature #3

Load Config Save Config

Delete Config New Config

Main Screen Acceleration: 0 g Phase: 180 deg Power: 0.0% Frequency: 60.40 Hz Stop

**Configuration Save Confirmation**

Save configuration?

Yes No

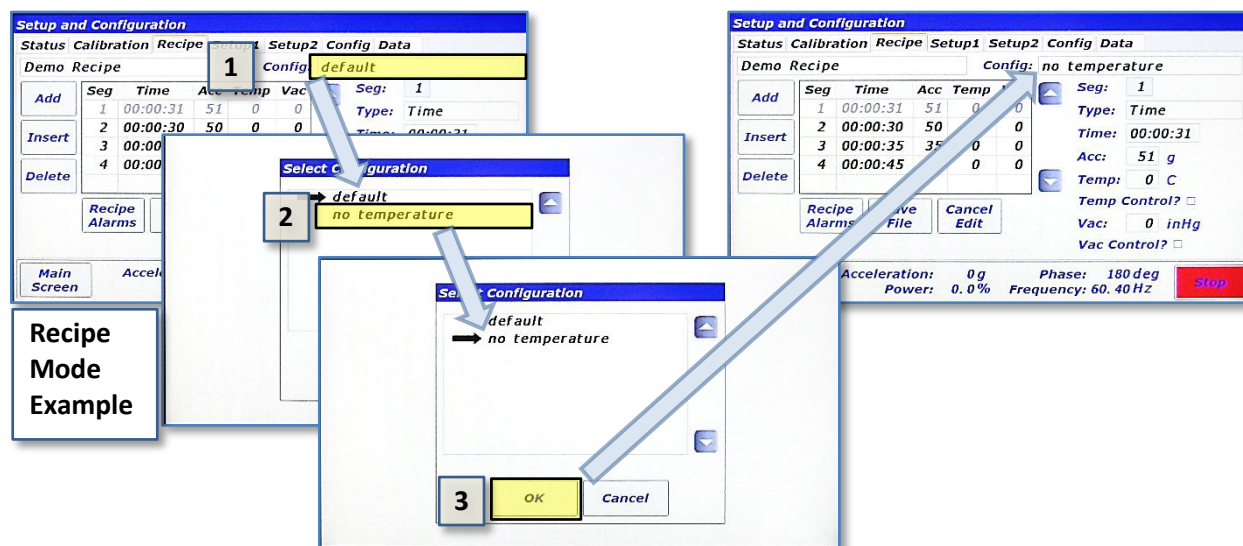
- Touch <Save Config> to save this configuration that does not use temperature monitoring.

- Touch <Yes> on the "Configuration Save Confirmation" dialog box.

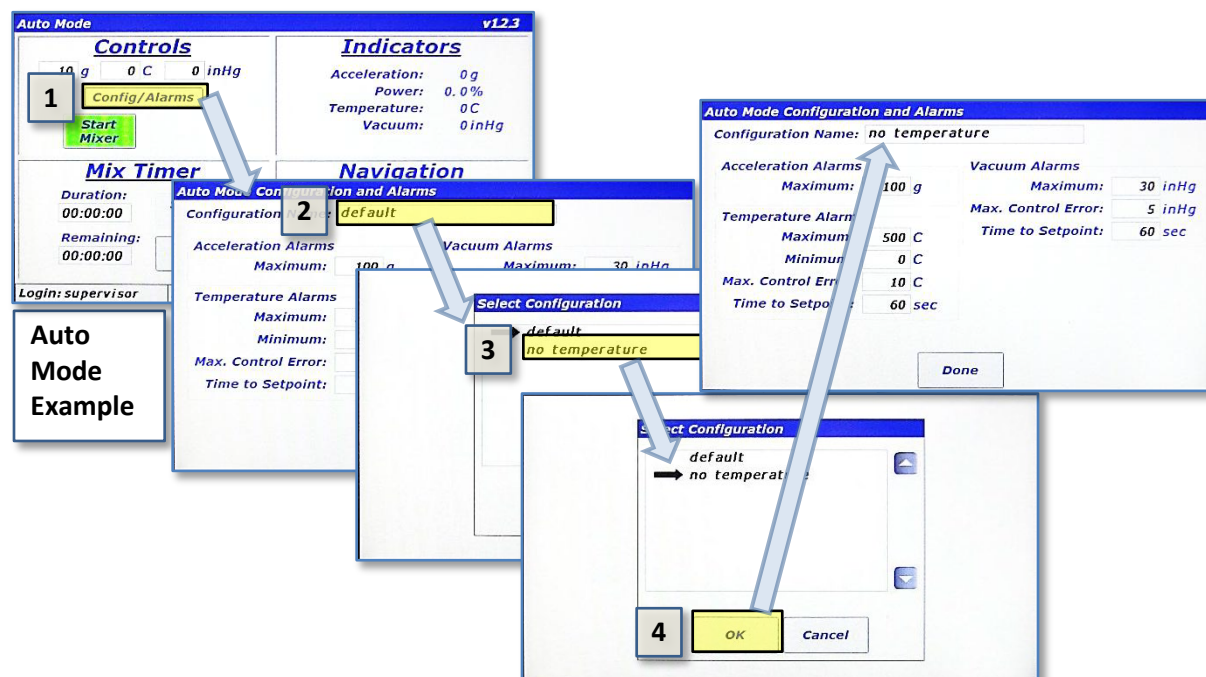


### 13.7.3 Configuration Usage

This section will provide a refresher of how Configurations are actually used. Configurations are used for both Recipe and Auto Mode. In Recipe Mode, the Configuration is selected as soon as a new recipe is created or by touching the textbox next to “Config:.” Refer to the following illustration.



In Auto Mode the Configuration is selected by first touching the <Config/Alarms> button in the Controls pane and then selecting it in the “Auto Mode Configuration and Alarms” screen.

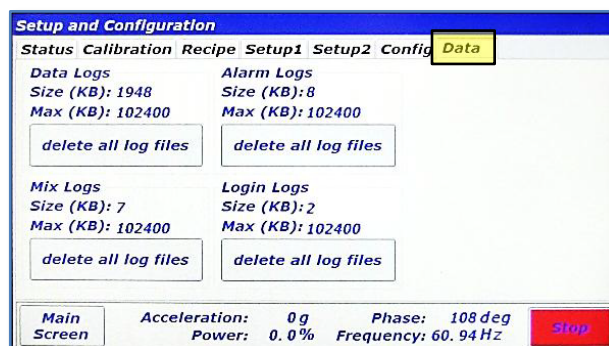


### 13.8 Data Tab

The *PharmaRAM™* II stores log files for a variety of purposes. The list below summarizes the files that are captured on the *PharmaRAM™* II.

- **Data Logs:** Measured paRAMeters are captured and written to data log files when the *PharmaRAM™* II is mixing/accelerating. Measured parameters include acceleration, power, temperatures, voltage/current, and vacuum.
- **Alarms Logs:** Every time an alarm is triggered, cleared, or acknowledged, a message is written to an alarm log file.
- **Mix Logs:** Mix Log files are written to whenever a mix cycle starts or stops. The mix log comment, start/stop time, operational mode, recipe name (if in recipe mode) are all written to the Mix Log files.
- **Login Logs:** Every successful and unsuccessful login attempt is written to a login log file.

It is the user's responsibility to manage the size of the log file directories. The Data Tab provides the means to clean up the log file directories.



Pressing the <delete all log files> button for any of the log file groups will delete all of the files in that directory. Warning alarms will be triggered if any of the directories exceed 100MB (102400kB), and files will be automatically deleted on a new day if any of the directories exceed 200MB.

All log files can be synchronized with a computer using the **RAM** Tool application developed by Resodyn Acoustic Mixers. Contact your Resodyn Acoustic Mixers salesperson to obtain a copy of **RAM** Tools at 406-497-5333.



## **14 Care and Maintenance**

Resodyn Acoustic Mixers are assembled at our corporate facilities in Montana, under a strict quality manual and an overriding corporate culture of building world-class equipment that is built to last.

In order to help ensure long life and effective maintenance, it is important to participate in general cleaning and maintenance as indicated below.

### **14.1 Preventive Maintenance**

The bellows can prematurely wear and become damaged if materials are allowed to be free in the resonator area. Cleaning of the upper resonator and bellows ensures a long life of the bellows. If necessary, use a small hand vacuum to clear debris from the bellows area, making sure not to create a vacuum between the device and the bellows material. Use a soft, non-abrasive cloth and water to complete cleaning the bellows.

### **14.2 Cleaning Procedures**

#### **Molded Plastic Acoustic Enclosure**

Clean with a soft, non-abrasive cloth and water with slight additives of neutral washing agents (pH 5 – 8). Greasy or oily substances may be removed by rubbing with a cloth wetted with isopropyl alcohol (IPA) or white spirit free of aromatic compounds.

Rinse with damp, cold water after every cleaning process to remove any remnants of the cleaning process.

Do not use solvents or similar containing esters, ketones, aromatics, or halogenated hydrocarbons. Do not use strong acids alkaline detergents or abrasives. Rinse with cold water after every cleaning process.

### **14.3 Accelerometer Calibration**

The *PharmaRAM*™II acceleration should be calibrated once a year or per the end users specified preventative maintenance schedule or when the accelerometer is replaced.

The calibration kit can be purchased or rented from Resodyn Acoustic Mixers.

### **14.4 Maintenance**

The *PharmaRAM*™II is designed with few serviceable replaceable parts.

#### **14.4.1 Major Repairs**

All repairs inside the enclosure should be diagnosed and repaired by Resodyn Acoustic Mixers trained repair personnel only.

All components not listed on the replaceable wear parts or spare parts list should also be replaced by Resodyn Acoustic Mixers trained repair personnel only.



Do NOT attempt to take off the acoustic enclosure because of electrical shock hazards. The high voltage symbol indicates the possibility of electrical shock.

### 14.4.2 Recommended Maintenance Schedule

The recommended preventative maintenance intervals for the *PharmaRAM™II* only involve the bellows (see Bellows replacement illustration below). The bellows are to be visually inspected weekly and replaced as necessary.

Recommended spare parts to have on hand are listed in Table 14-1 as well as their quantities.

**Table 14-1. Spare Parts List.**

Description	Part Number	Quantity
Inner Bellows Gasket	102805	1
Outer Bellows Gasket	101899	1
Fuses, 10A, Time Lag (For 100-120 VAC)	002618	2
Fuses, 8A, Time Lag (For 200-240 VAC)	002942	2

### 14.5 Replacement of Serviceable Parts

Common client serviceable replacement parts are identified below. These parts are the fuses, bellows, and accelerometer, and are listed in Table 14-2. The bellows estimated life is greater than 500 hours and the accelerometer is greater than 2,000 hours.

**Table 14-2. Customer Replaceable Parts List.**

Description	Part Number	Quantity
Accelerometer & Integrated Cable Assembly	102592	1
Inner Bellows Gasket	102805	1
Outer Bellows Gasket	101899	1
Fuses, 10A, Time Lag (For 100-120 VAC)	002618	2
Fuses, 8A, Time Lag (For 200-240 VAC)	002942	2

#### 14.5.1 Fuse Replacement

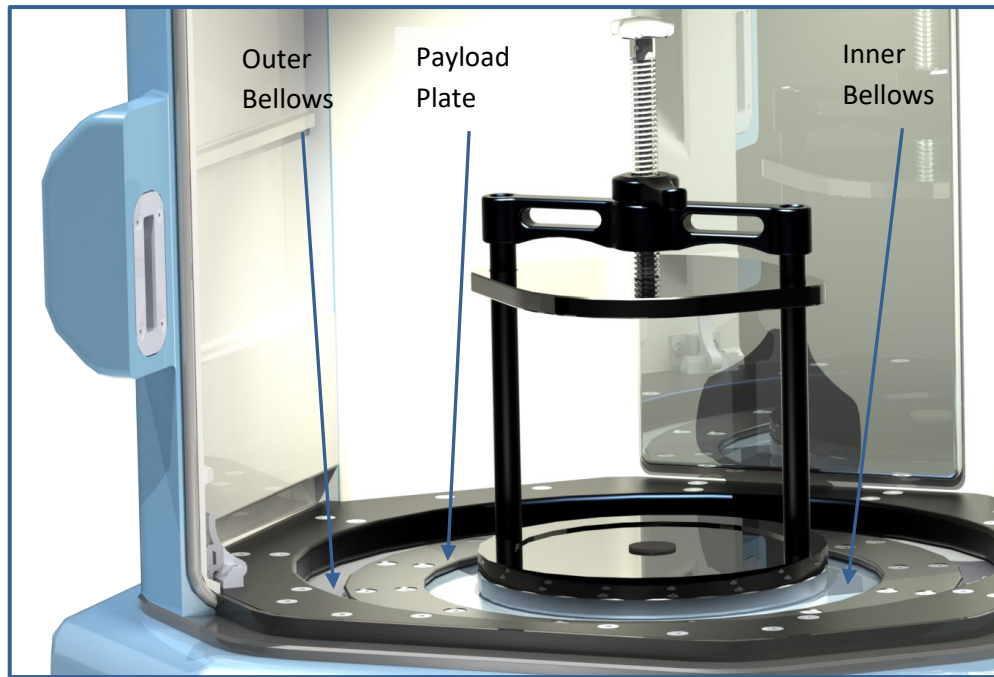
The fuse should only be replaced when the machine does not power up, but power is being delivered to the machine. If this occurs, please call your Resodyn Acoustic Mixers representative for further instructions.

Fuse access is located on the lower left area of the back of the *PharmaRAM™II*, shown in Section 6.6 Electrical Connections. Turn the fuse cap counterclockwise to remove fuse.

Insert new fuse into cap and turn cap clockwise until secure. If the *PharmaRAM™II* does not power up, please call Resodyn Mixers service at 406-497-5333.

### 14.5.2 Bellows Replacement

The *PharmaRAM*™ II is equipped with a sealed inner enclosure that houses the Resonator. The interior of the machine is sealed with inner and outer bellows between the moving plates and the enclosure. These bellows are designed for operational life greater than 500 hours. Should replacement be required, instructions for the bellows are provided with the replacement parts.



### 14.5.3 Accelerometer Replacement

The *PharmaRAM*™ II is equipped with an accelerometer that is mounted to the underside of the Payload Plate, shown above. The accelerometer is designed for an operational life greater than 2,000 hours. Should replacement be required, instructions for the accelerometer are provided with the replacement part. When an accelerometer is replaced, the *PharmaRAM*™ II must be calibrated or damage to the machine may occur. Calibration Kits are available through Resodyn Acoustic Mixers.

### 14.5.4 Technical Support for Mixer Operation:

Phone: (406) 497-5333 Fax: (406) 497-5206 e-mail: <a href="mailto:service@resodynmixers.com">service@resodynmixers.com</a>	Resodyn Acoustic Mixers 130 North Main, Suite 630 Butte, Montana 59701
--	--

## 15 Troubleshooting and Service

The *PharmaRAM*™ II system should only be operated when it is in good working condition. If the system shows any signs of visible damage or fails to operate as outlined in this manual, the system should not be operated.

For operational errors and troubleshooting, refer to the Troubleshooting section.

If necessary, contact your Resodyn Acoustic Mixers customer service representative with questions or additional technical support related to the mixer at 406-497-5333.

Some straightforward solutions to resolve common operational events are shown below. Review the chart before contacting your Resodyn Acoustic Mixers service representative. If the problem persists, contact your customer service representative at the phone number above.

**Table 15-1. Troubleshooting Table.**

Description of Problem	Potential Problem	Solution
<b>Mixer will not power up</b>	Power cord unplugged	Ensure that the power cord is plugged into the mixer and a wall outlet.
	Main fuses blown	Contact Resodyn Acoustic Mixers for replacement fuses.
	Power switch off	Ensure that the power switch (located on the back of the machine above power cord socket) is in the on position, "I."
<b>Door Opened During Operation</b>	Door opened before mixer stopped	Door was opened when the mixer was running, which stopped the machine. Do not open the door while the mixer screen shows "Running" in the status bar.
<b>Broken Accelerometer</b>	Accelerometer cable or accelerometer has failed	Accelerometer and cable assembly must be replaced. Call Resodyn.
<b>Amplifier Over Temperature</b>	Mixer amplifier is too hot	Ensure adequate ventilation on the backside of the mixer.
		Ensure room temperature is within specified range.
<b>Enclosure Over Temperature</b>	Mixer enclosure is too hot	Ensure adequate ventilation on the backside of the mixer, at least 1" – 2".
		Ensure room temperature is within specified range.
<b>Amplifier Error</b>	Vessel overloaded	Remove mix material until it is within the maximum specified load limits, i.e., no more than 1000 grams.
	Shorted wire	Contact Resodyn Acoustic Mixers.
	Broken wire	Contact Resodyn Acoustic Mixers.

Description of Problem	Potential Problem	Solution
<b>Amplifier Over Current</b>	Vessel overloaded	Remove mix material until it is within the maximum specified load limits.
	Incorrect fixture file	Ensure that the correct fixture file is being used for the fixture on the <i>PharmaRAM™II</i> .
<b>Over Acceleration (g)</b>	Mixer exceeded maximum acceleration	Contact Resodyn Acoustic Mixers.
<b>HMI Comms Error</b>	The HMI has ceased to communicate with the main controller	Contact Resodyn Acoustic Mixers.
<b>Vacuum Module Comms Failure</b>	Communication Cable Unplugged	Ensure that the communication cable between the <i>PharmaRAM™II</i> and the vacuum module are connected.
	Vacuum module turned off	Ensure that the vacuum module is plugged in and turned on.
<b>Fixture Limit, High Accel. or User Limit, High Accel.</b>	Accelerometer cable or accelerometer has failed	Accelerometer and cable assembly must be replaced.
	Incorrect user limit	Verify user limits are correct.
<b>Fixture Limit, High Temp. or Fixture Limit, Low Temp. or User Limit, High Temp. or User Limit, Low Temp.</b>	RTD not plugged in	Verify the RTD is plugged in, or if not in use, ensure Configuration has Temperature #1 unchecked.
	Broken RTD or RTD cable	Replace RTD and accelerating portion of RTD cable.
	Bad RTD calibration	Verify RTD calibration.
	Incorrect user limit	Verify user limits are correct.
<b>Fixture Limit, High Vac. or User Limit, High Vac.</b>	Bad vacuum calibration	Verify vacuum calibration.
	Incorrect user limit	Verify user limits are correct.
<b>User Limit, Vac. Ctl. Error or User Limit, Vac. Ctl. Time</b>	Vacuum leak	Check the system for a vacuum leak
	Disconnected vacuum line	Ensure all vacuum lines are connected correctly
<b>Over Accel. at Low Frequ.</b>	Vessel overloaded	Remove mix material until it is within the maximum specified load limits or reduce acceleration.
	Incorrect fixture file	Ensure that the correct fixture file is being used for the fixture on the <i>PharmaRAM™II</i> .



## 16 Warranty

### 16.1 *Limited Warranty:*

Seller warrants that for a period of one (1) year from the date of Seller's shipment of Product to Purchaser its Product is free from defects in material and workmanship. Some newly manufactured Seller Products may contain, and Seller Service may use, remanufactured parts which are equivalent to new in performance. The warranty period for the Product is a specified, fixed period commencing on its date of shipment, or the date of installation if installed by Seller. Seller does not warrant that the operation of Products will be uninterrupted or error free.

If Seller receives written notice of defects from Purchaser during the warranty period, Seller will, at its option, repair or replace the affected Products.

The warranties provided herein will apply only to those Products and Service which are branded by Seller with a Seller trademark ("Resodyn Branded"). Seller does not warrant any third party Products or Service even if included with other Resodyn Branded Products or Service. Furthermore, Seller provides all such third party Products and Service AS IS. However, the original manufacturers or suppliers may provide their own warranties as specified in the documentation accompanying such third party Products and Service.

The above warranties do not apply to defects resulting from:

1. Improper or inadequate maintenance by Purchaser
2. Unauthorized modification
3. Improper use or operation outside of the Specifications for the Product
4. Abuse, negligence, accident, loss, or damage in transit
5. Improper site preparation
6. Unauthorized maintenance or repair

THE ABOVE WARRANTIES ARE EXCLUSIVE AND NO OTHER WARRANTY, WHETHER WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED. TO THE EXTENT PERMITTED BY LAW, SELLER SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, AND NONINFRINGEMENT.

In no event shall Seller be liable for any consequential damages or damages of any kind or nature alleged to have resulted from any breach of warranty.

