

RS 2000pro

Quick Reference Guide

Rad Source Technologies, Inc.

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USER RESPONSIBILITY

In order to operate properly, this product must be installed, operated, and maintained in accordance with the procedures described herein.

Periodic inspection of the RS-2000pro will aid in detecting anything that may cause problems with the unit's operating performance. If any part is found to be worn, broken, or damaged in any way, immediately contact Rad Source Technologies, Inc.

Only Rad Source Technologies, Inc. authorized persons should perform repair procedures.

Any alteration to the RS 2000pro not in accordance with the procedures set forth by Rad Source Technologies, Inc. places sole responsibility on the user for any malfunction resulting from faulty maintenance, improper repair, damage, or alteration by any person other than Rad Source Technologies, Inc. authorized persons.

 **WARNING** The RS 2000pro should only be operated by AUTHORIZED PERSONNEL who have thorough knowledge of the proper use of the device. The key for the unit (Fig.) should be accessible only to AUTHORIZED PERSONNEL.

Questions about its use should be addressed to Rad Source Technologies, Inc. at (678) 765-7900 or email service@radsource.com.

SYSTEM DESCRIPTION AND INDICATIONS FOR USE

This is an industrial X-Ray Device and is not approved for use on humans. It is for use by properly trained operators for research laboratory and other specialty applications.

SAFETY INFORMATION AND SYMBOL USE

Specific notations are used in this manual to call attention to conditions that could potentially result in injury, damage to equipment, or require special attention.

WARNING, CAUTION, and NOTE may be used throughout this manual and on the RS 2000-350 to emphasize important and critical information. You must read these statements to help ensure safety and to prevent product damage.

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTE: Used to notify people of installation, operation, or maintenance information that is important, but not hazard-related.

IMPORTANT SAFETY INSTRUCTIONS

Also, note additional SAFETY instructions will be found throughout this manual and ALL must be heeded.

⚠ WARNING This unit is to be installed only by factory-authorized personnel. DO NOT ATTEMPT to install or otherwise apply or attach any electric power to the unit prior to contacting Rad Source Technologies, Inc. at service@radsource.com or call (678) 765-7900.

⚠ WARNING The machine is extremely heavy and movement should only be done AFTER CONSULTING WITH the manufacturer. NEVER attempt to move the machine once it has been installed BEFORE contacting the manufacturer. Sudden movement, or movement over uneven floors, inclines, or declines may result in tipping. A level floor is required for installing this unit.

⚠ WARNING This unit is to be serviced by trained personnel only. Do not remove any covers or adjust any screws, bolts, or related fasteners.

⚠ WARNING This manual instructs how to use the RS 2000pro. If you disregard the instructions or information in the manual, you could be assuming responsibility for, damages, cost, or injury incurred by such disregard.

⚠ WARNING This device is equipped with safety interlocks incorporated into the chamber door and x-ray tube access panel to prevent the unit from operating when the chamber is open. Overriding, modifying, adjusting, or in any way defeating these interlocks is hazardous.

⚠ WARNING If any obvious mechanical damage is detected or suspected, cease use immediately and contact Rad Source Technologies, Inc. at (678) 765-7900.

⚠ CAUTION Please keep unit dry. When cleaning, do not allow cleaners or water to drip into panels or chamber. Only use damp cloth with mild detergents for cleaning.

⚠ CAUTION Do not use the top of the unit as a storage area or place any heavy items or items containing liquids or materials that harm the unit if leaked or spilled on top or inside.

SYSTEM COMPONENTS

1. X-ray Indicator Lights – Two red lights. They will flash in an alternating fashion to indicate when x-rays are being produced. They will both light red when the machine is momentarily evaluating conditions prior to turning on x-rays.
2. HMI Panel – Contains operating and display controls and indicators
3. Emergency Stop Button – Press in case of emergency. This button will prevent the machine from generating x-ray until properly reset.
4. Key Switch – 2 position one momentary select switch. This is used to power the display and X-ray tube. Power on LED – Indicates the machine is on and ready for operation. This does not mean x-rays are being generated. X-rays are being generated when the X-ray Indicator Lights are on.
5. USB Data Port–The USB port is used to connect a USB drive to the RS 2000-350
NOTE: Separate, optional equipment can be used with the RS 2000-350.
6. Load Doors – This is a heavy doors made primarily of shielding material in the form of lead which shields the x-rays in the irradiation chamber. It is held in the closed position by a magnetic latch and Solenoid that is released only by pressing the Door Release Button on the HMI Panel.
7. Solenoid Lock. It will get charge after the magnet is get lock on both doors as extra safety lock.
8. The Magnet get in charge to make sure the doors are close and stay close during the cycle.

INSTALLATION AND SITE REQUIREMENTS

OPERATING THE RS 2000-350

⚠ WARNING The RS 2000-350 should only be operated by AUTHORIZED PERSONNEL who have thorough knowledge of the proper use of the device. The key for the unit (Fig.) should be accessible only to AUTHORIZED PERSONNEL.

Questions about its use should be addressed to Rad Source Technologies, Inc. at (678) 765-7900 or email service@radsouce.com.

Indications for use – RS 2000-350

Turning the system on

The RS 2000-350 should be performed by AUTHORIZED PERSONNEL only. Turn the key right to the RESET position until the green light turns on. Turn the key left to the ON position. The machine is ready to operate when the following screen is displayed.

ADMINISTRATION INFORMATION

Adding a user

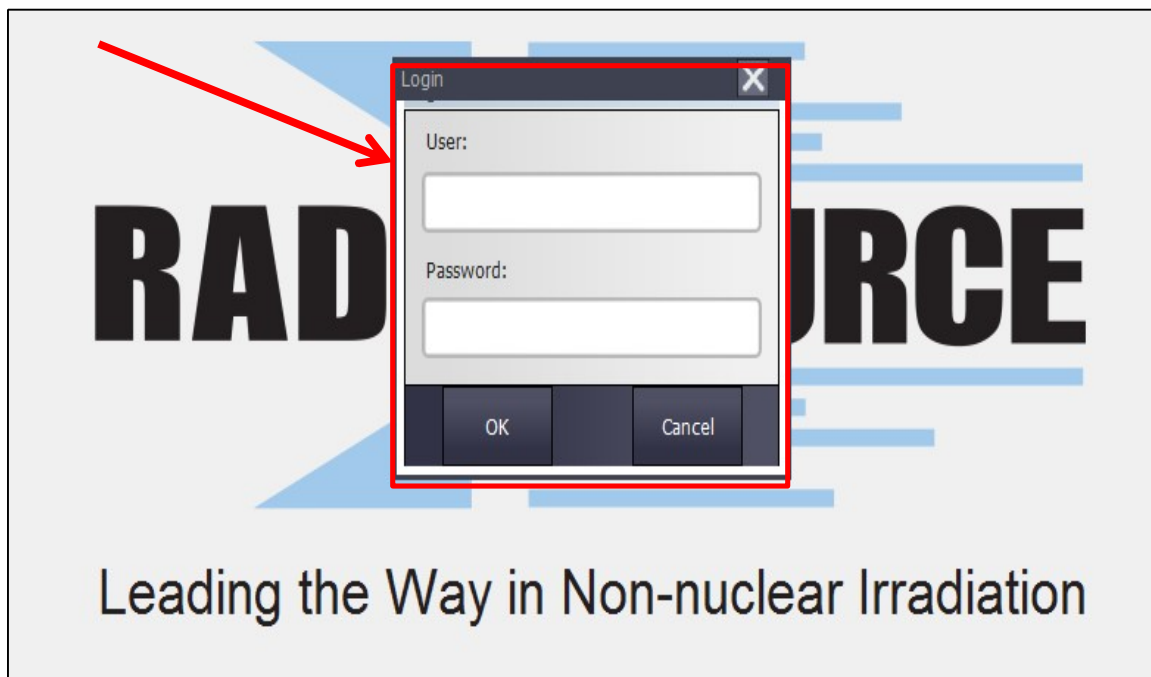
1. Touch the screen to bring up the login. If this is the first use of the system, login using:

User Name: admin

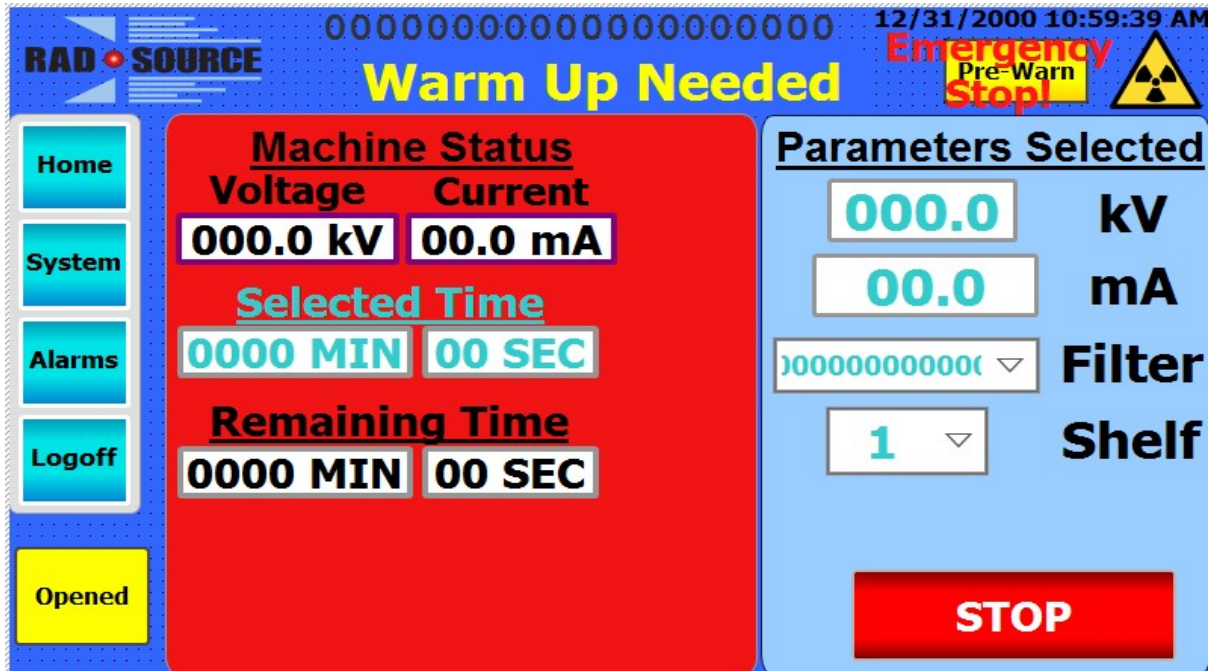
Password: password

Press OK, then touch anywhere on the screen again to complete the login process. Admin should change password once logged in (see **USER INFORMATION**)

Fig.3: Login Screen

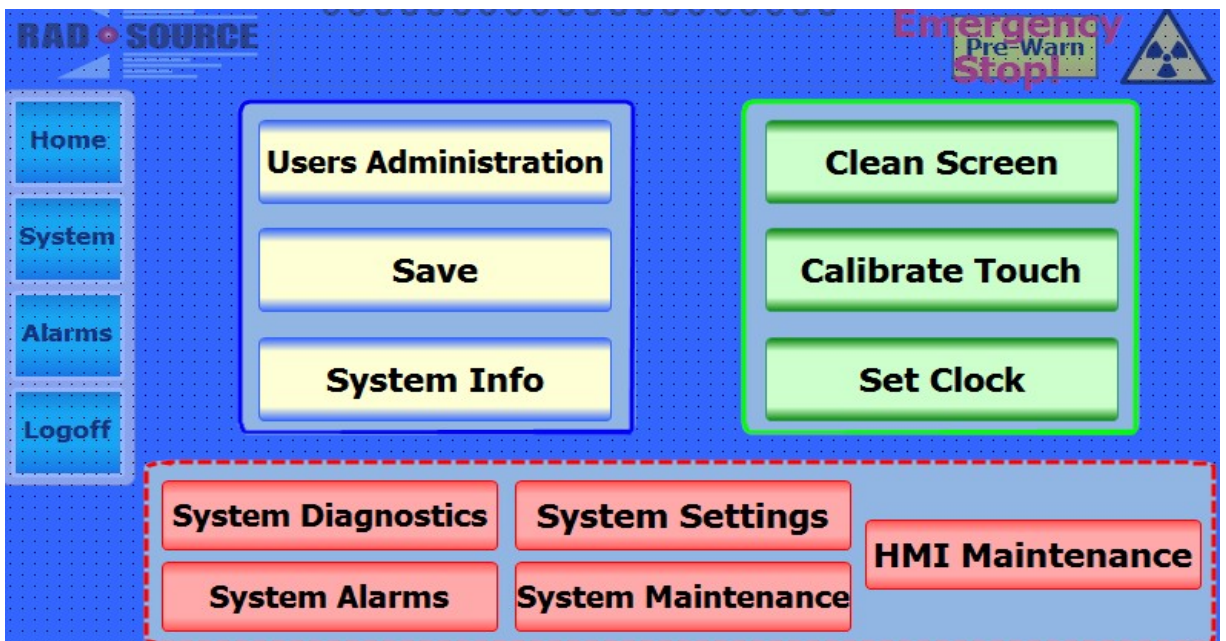


- 2. Select System
- 3. **Fig.4: System Button**



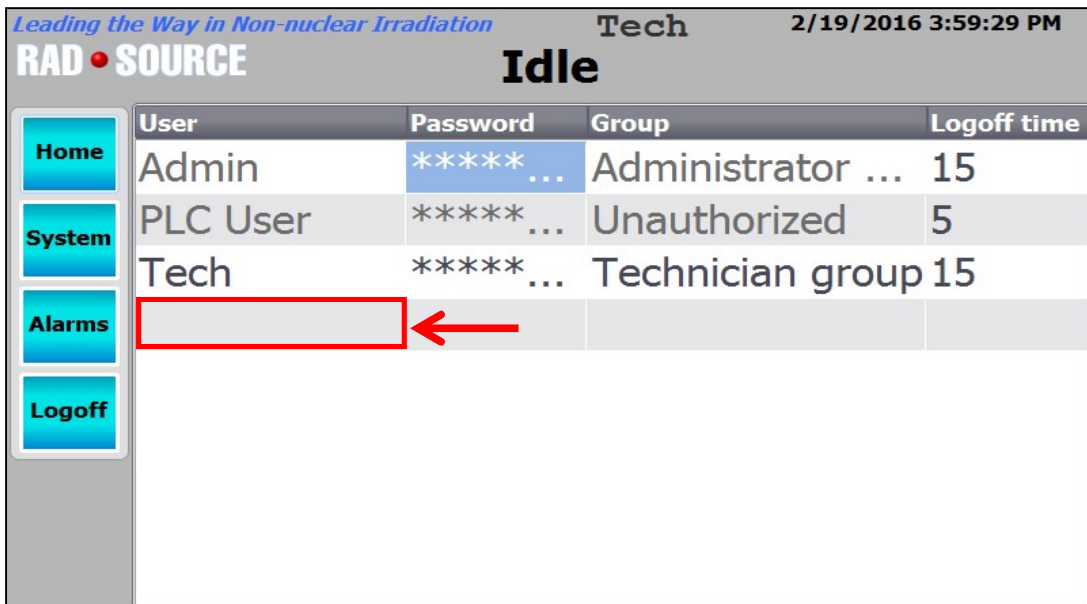
- 4. Select Users Administration

Fig.5: Users Administration Button



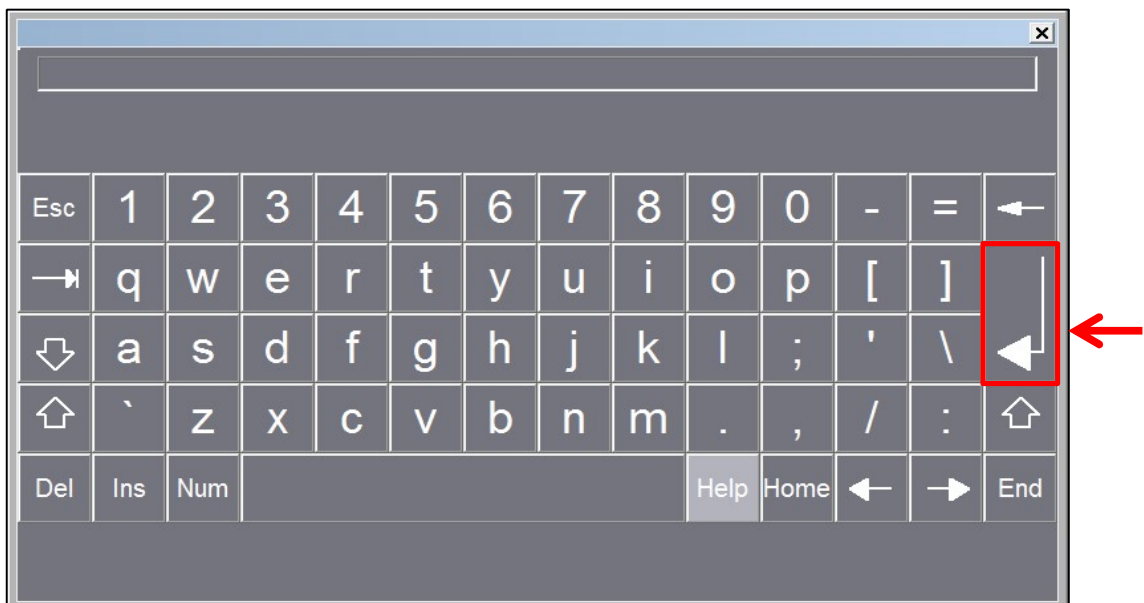
5. Click on User Administration Button.
6. In the User column, double tap directly below the last user field to bring up a key pad.

Fig.6: New User Field



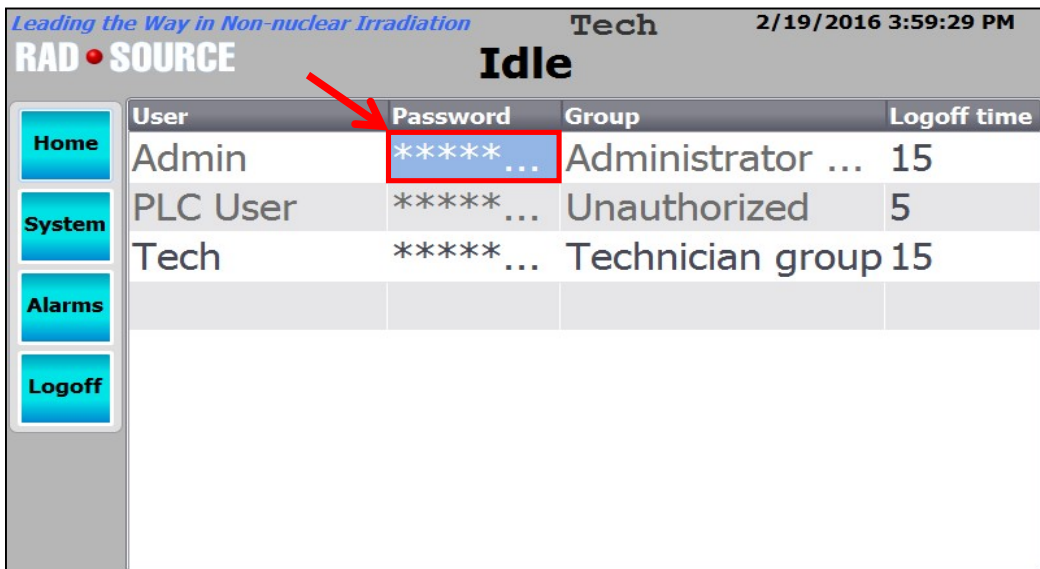
7. Enter desired user name (40 character limit) then press the enter key.

Fig.7: Enter Key



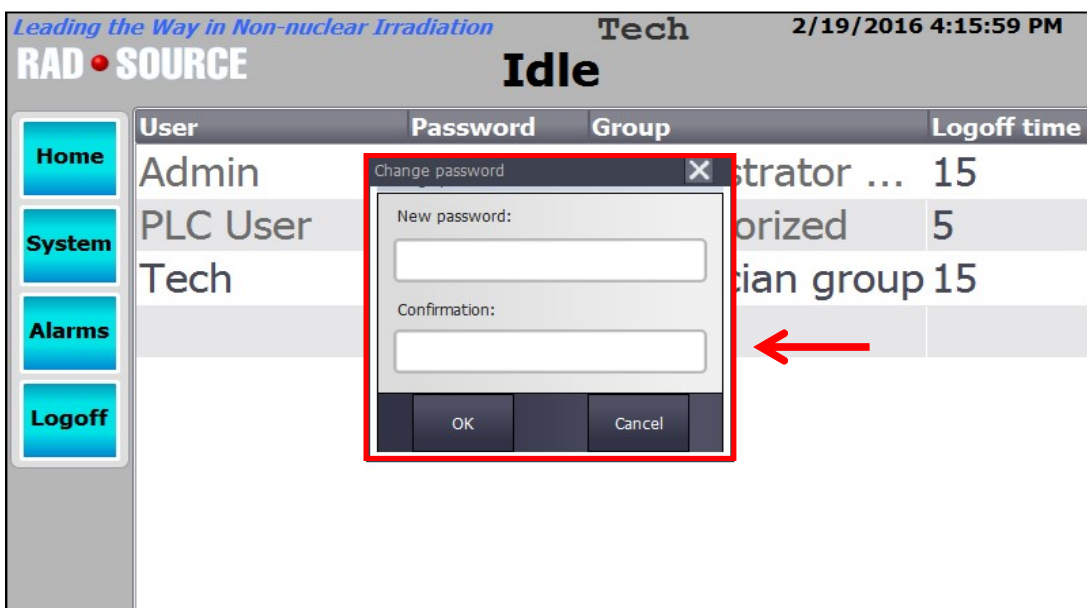
8. Double tap the field to the right under the Password column.

Fig.8: Password Field



9. Enter and record a generic password (4-24 character limit, no special characters e.g. /, *, %, (,) etc.) and repeat the password in the confirmation box below.
NOTE: New Users should be notified to change the passwords upon login (see **USER INFORMATION**). For security reasons 8 * will always be displayed in the password field.

Fig.9: Change Password



10. After the password is created the Users will sort alphabetically.
11. Press the field to the right of the New User to highlight the group column.
12. Use selection arrow to the right to reveal the available assignment groupings.

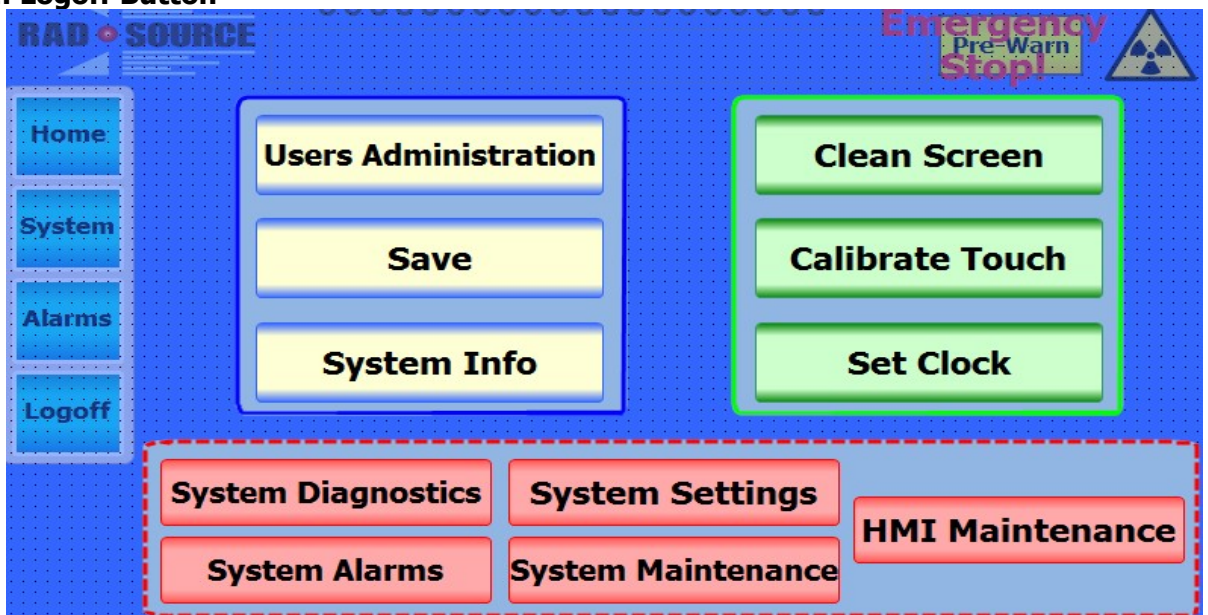
Fig.10: Authorization Table: Using the table below, assign the user to their appropriate group based on their authorized privileges. Administrators should only assign personnel for their appropriate groups/sections.

NOTE: Some functions are only available to field technicians. **(Table.10)**

	Admin	Writer	Selector
Create/assign Users	X		
Monitor machine status	X		
Change experimental parameters	X		
Create experiments manually	X	X	
Select and run programs	X	X	X
Edit programs	X	X	
System menu access	Full	Limited	Limited

13. Assign the inactivity Logoff Time appropriate for the user (no data is lost if system inactivity logoff occurs).
14. When finished, press Logoff (all changes will be saved). Then select Logoff, again.

Fig.11: Logoff Button



Removing a user

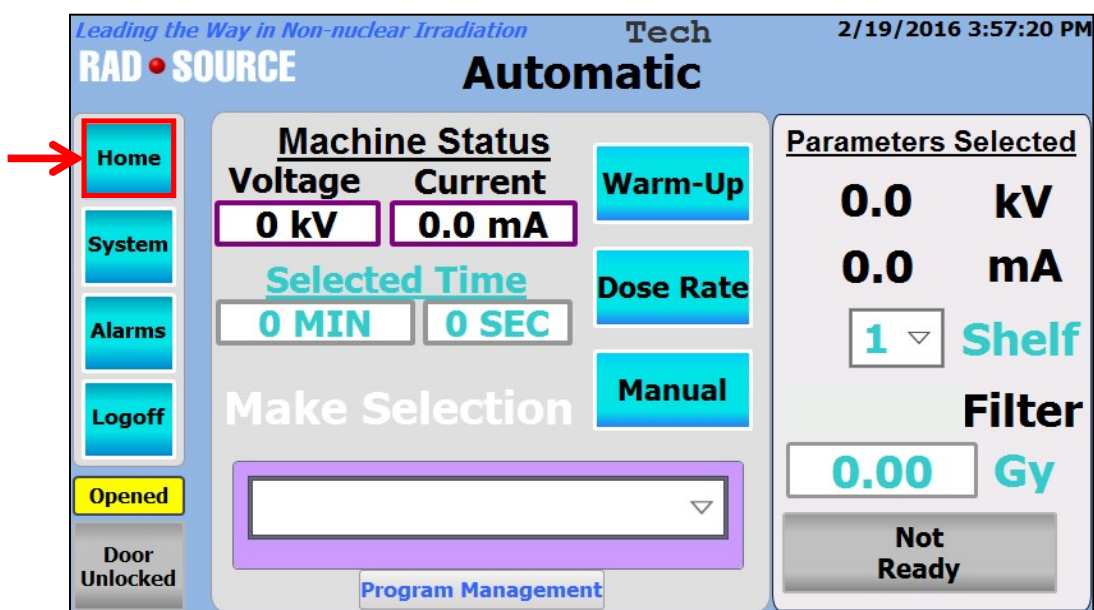
1. Select System (See Fig. 4)
2. Select Users Administration (See Fig. 5)
3. In the User column, double tap the User field you wish to remove to bring up a key pad. (See Fig. 6)
4. Delete the User name then press enter (See Fig. 7). All fields should be removed.

USER INFORMATION

Changing a password

1. Touch the screen to bring up the login (See Fig. 3). New Users should sign in using the information given to them by the admin.
2. Press OK, then touch anywhere on the screen again to complete the login process.
3. Select System (See Fig. 4)
4. Select Users Administration (See Fig. 5)
5. Double tap the Password field to the right of your user name and create a new password (4-24 character limit, no special characters e.g. /, *, %, (,). (See Fig. 8 and 9)
NOTE: For security reasons 8 * will be displayed in the password field.
6. Hit the home button to return to the main screen.

Fig.12: Home Button

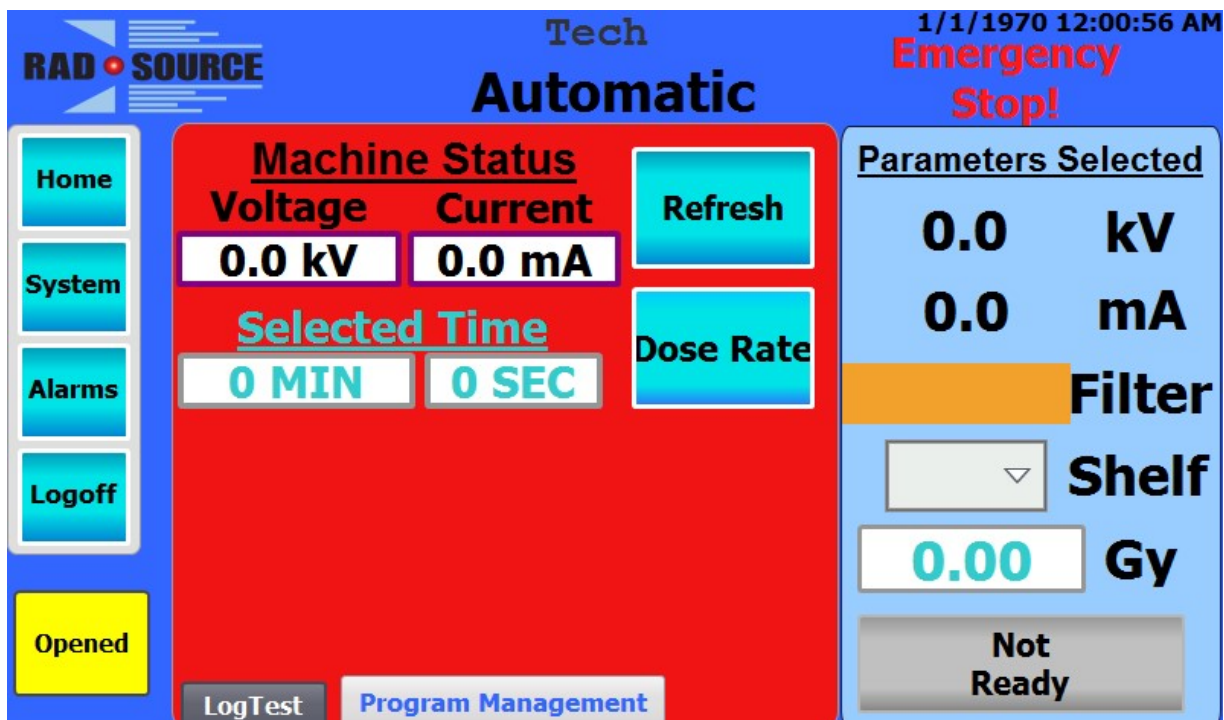


MACHINE OPERATION

Writing a new Automated Program (Admin, Writer)

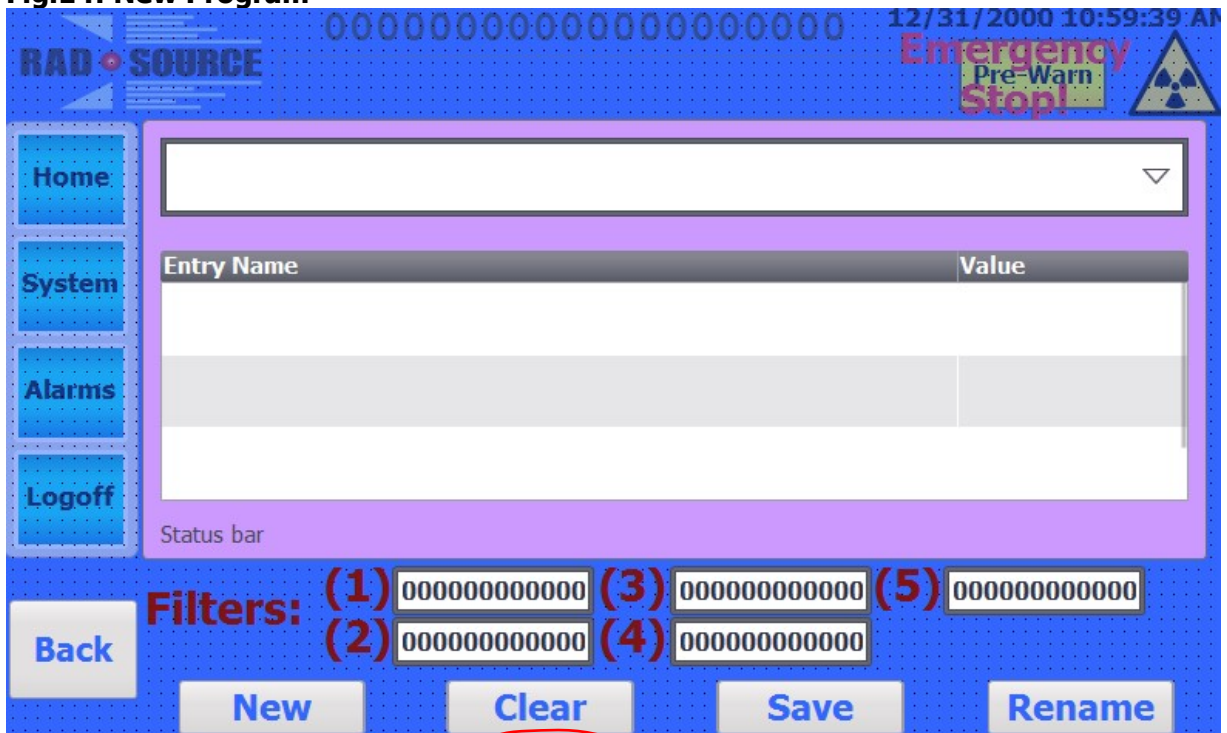
1. Touch the screen to bring up the login. Login using your username and password.
2. Press "OK", then touch anywhere on the screen again to complete the login process.
3. At the bottom of the screen, press Program management.

Fig.13: Program Management



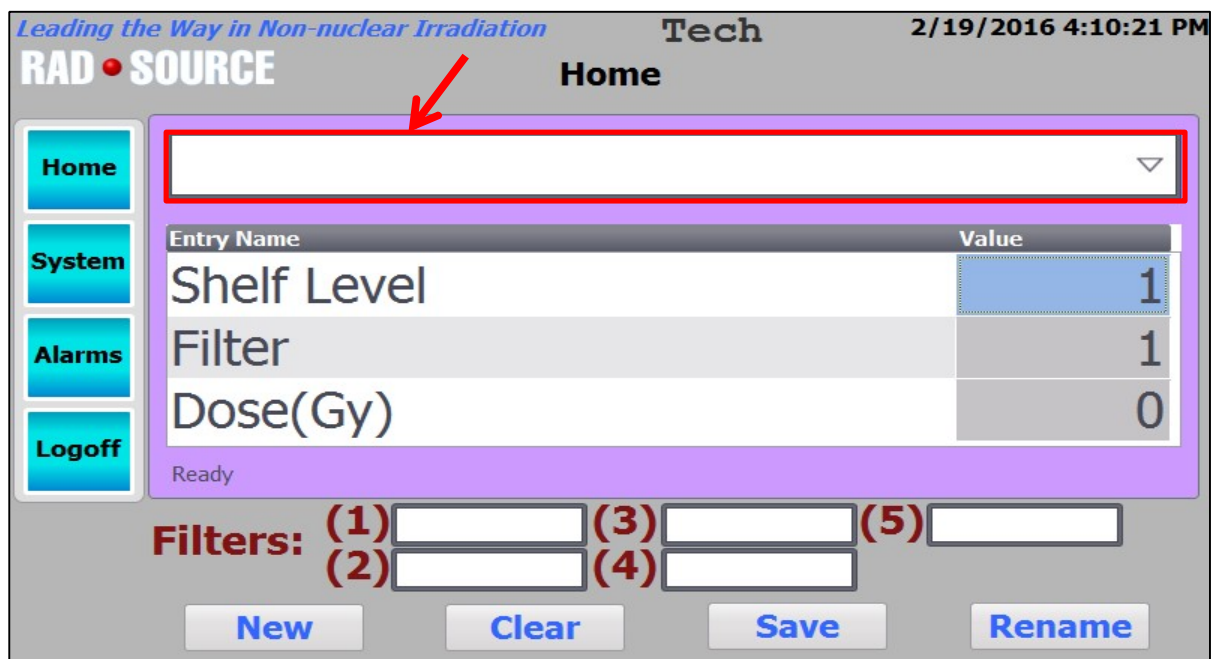
- At the bottom of the screen, press New.

Fig.14: New Program



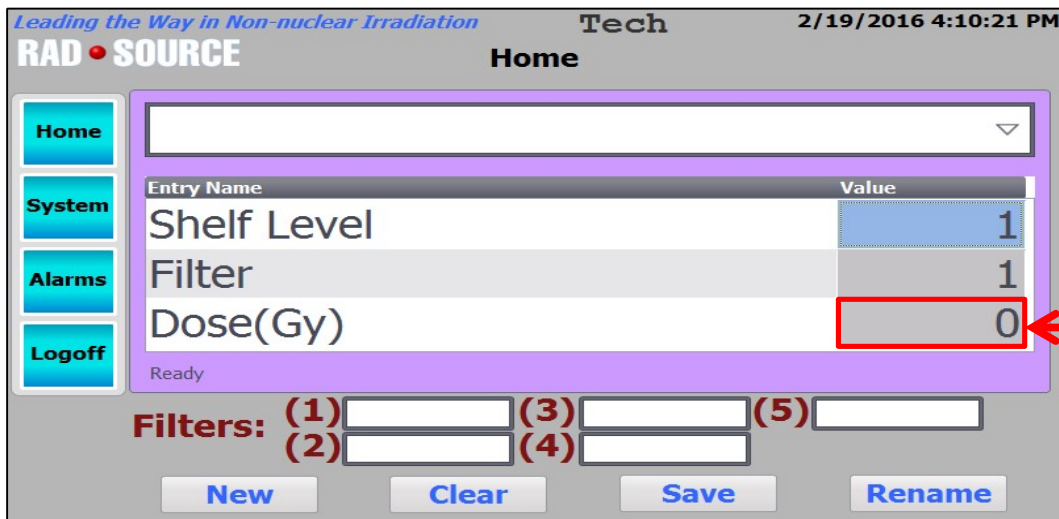
- Press the naming box to bring up a key pad and assign a program name.

Fig.15: Name Program



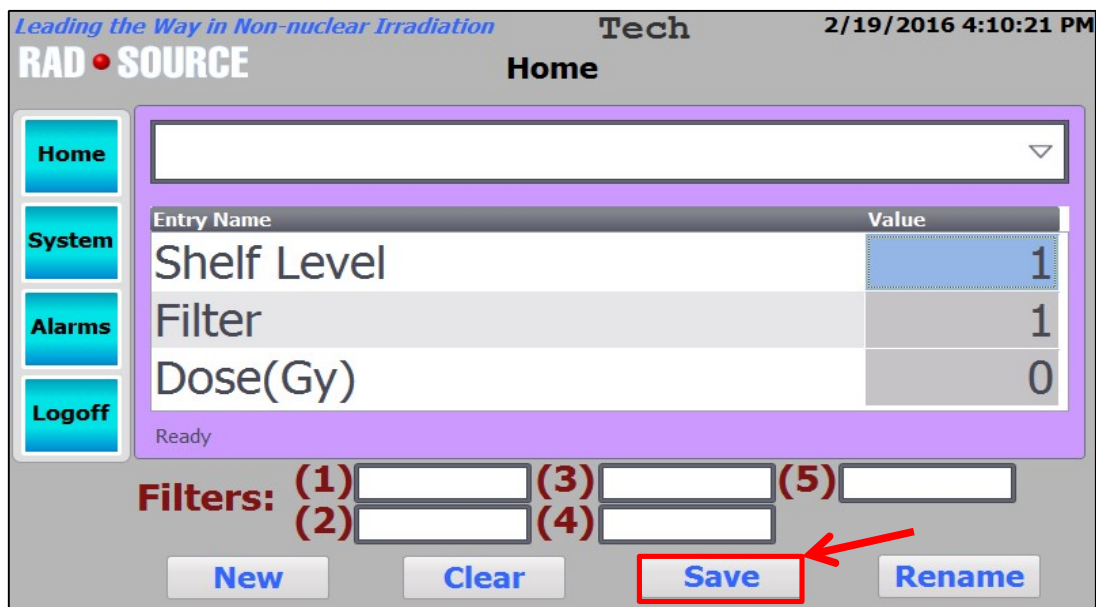
- Under the value column select the desired shelf level (0-4, 0 = floor of the machine).
- Input the total desired dose value (Gy) in the appropriate field. (MAX: 999.99 Gy)

Fig.16: Gray Input



- Press Save or press Home and accept the save prompt.

Fig.17: Save Program



Performing an X-Ray tube warmup

1. A prompt will appear if a warm up is needed. (If the machine has been inactive for more than 6 months, use the extended warm-up process. See Fig. 23)

Fig.18: Warm Up Needed



Note: Make sure all doors and Solenoid Locked then the system will change the Not Ready bottom to start bottom. (Fig.22)

Fig.19: Start Warm-Up

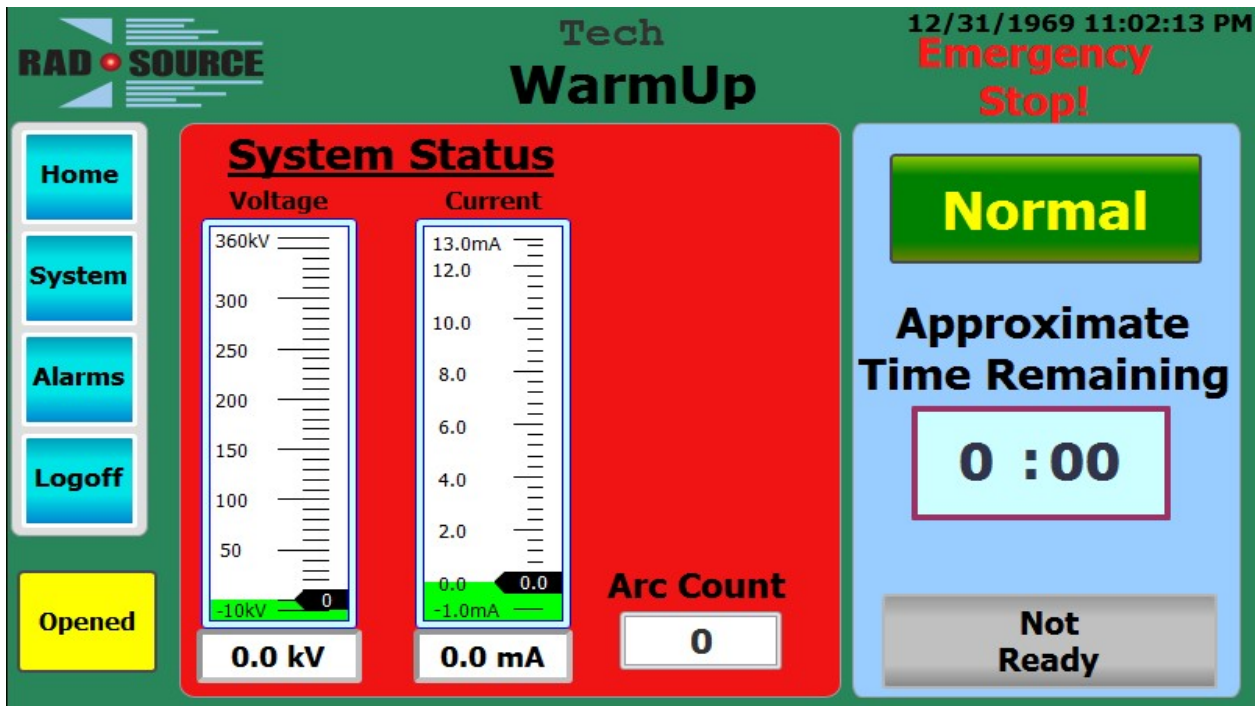
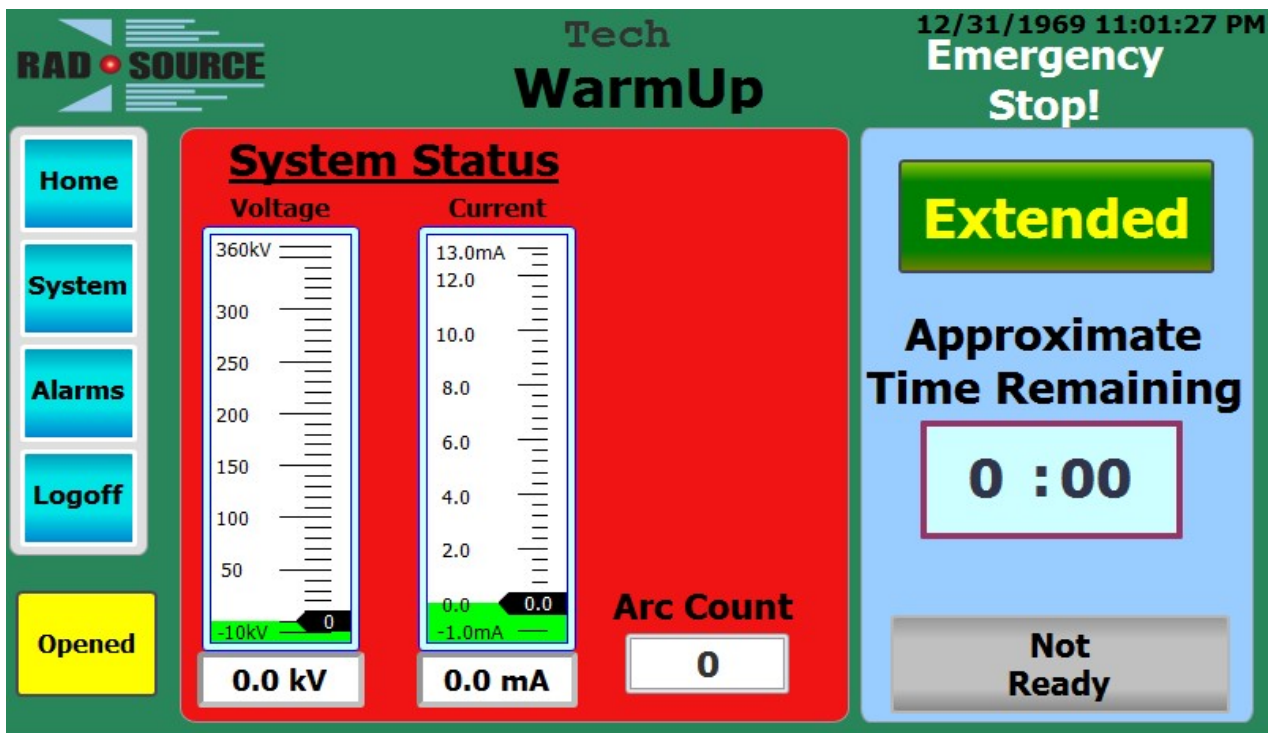


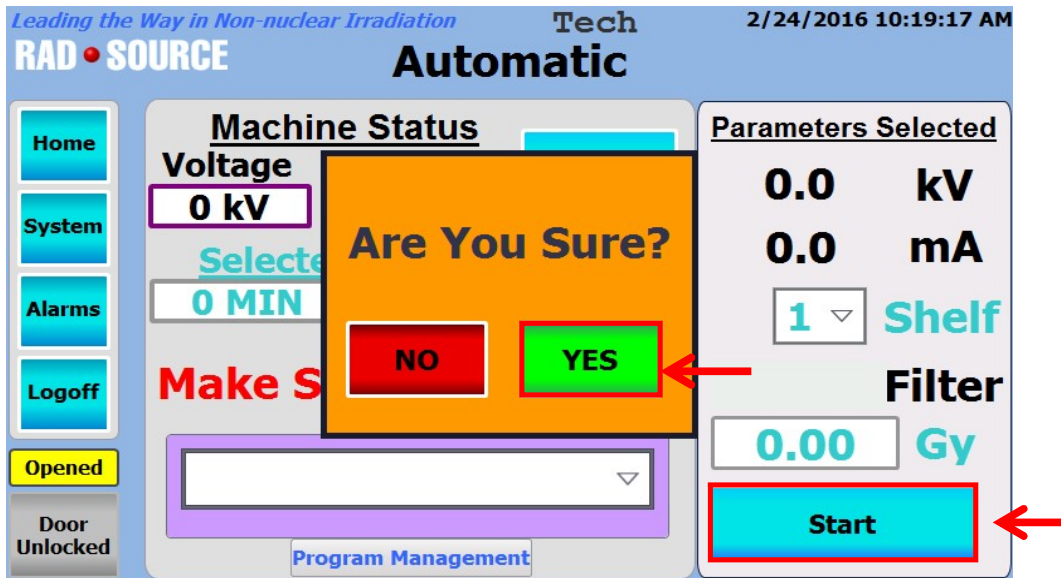
Fig.20: Extended Warm-Up



Automatic mode:

1. Close the door.
2. Press Start and confirm start. Upon completion press Start.
NOTE: If you decide to cancel the run, press Stop.

Fig.21: Start/Confirm Start

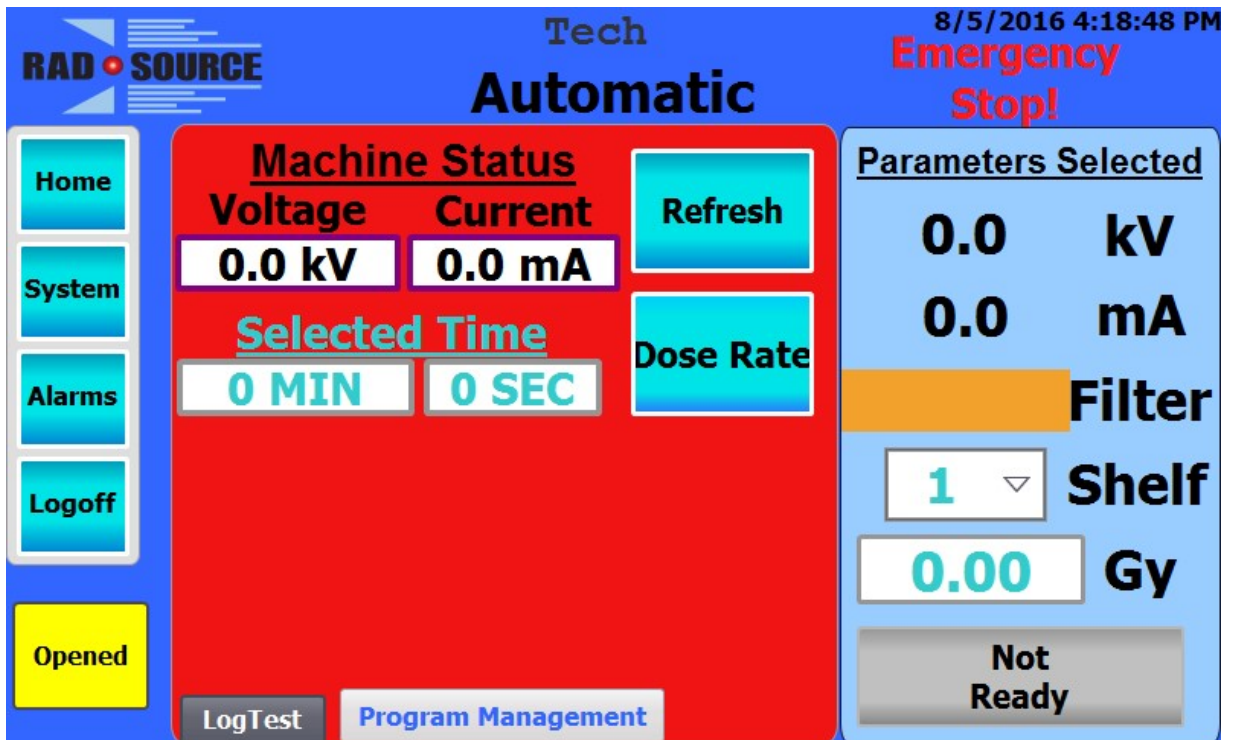


3. When exposure is completed and door unlocks.

Running a Timed Exposure (Admin, Writer)

1. Press Home.(See Fig. 13)
2. The corresponding dose (Gy) will be displayed in the parameters window.

Fig.22: Time/Shelf Input

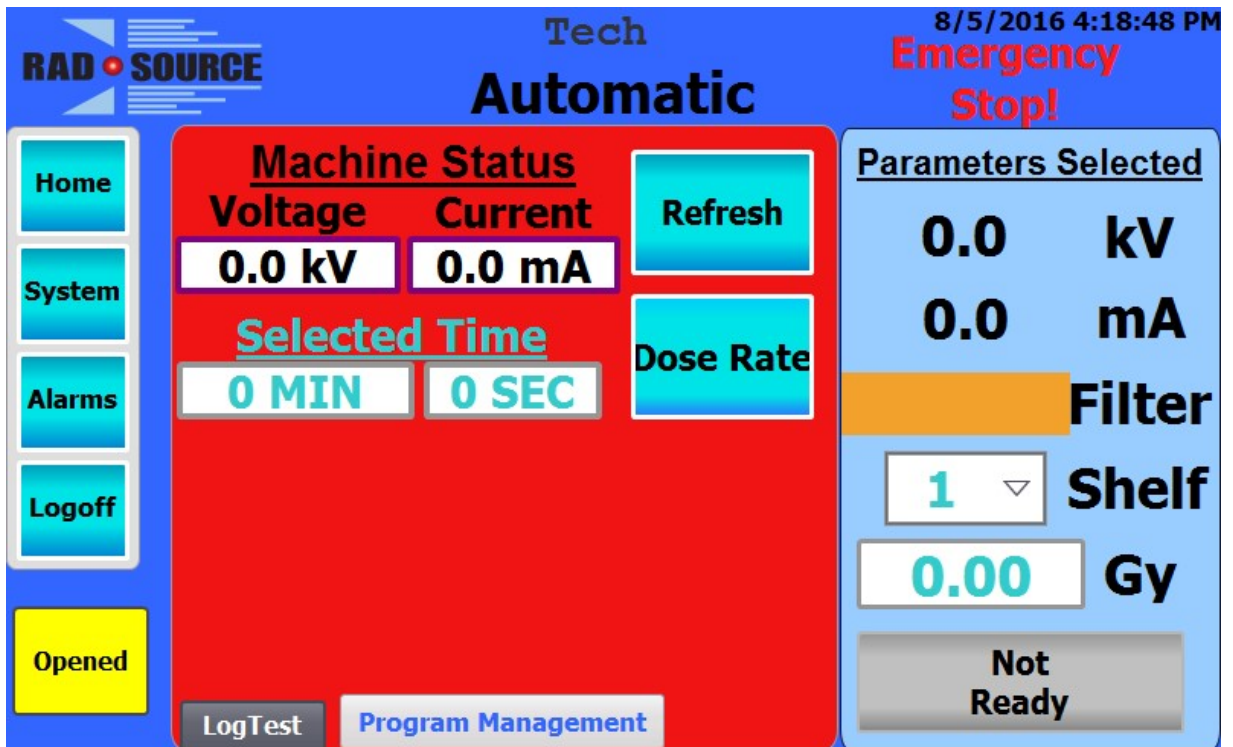


3. Press Unlock Door, open the door, and load your sample.(See Fig. 26)
NOTE: A four second delay is required for the door to self-lock however; starting the run will also lock the door.
4. Close the door.
5. Press Start and confirm start.(See Fig. 27)
NOTE: If you decide to cancel the run, press Stop.
6. When exposure is completed, the solenoid and magnet on doors will be uncharged and the doors are ready to get open.

Running a Desired Dose Exposure (Admin, Writer)

1. Press Home. (See Fig. 13)
2. Input the desired dose. The corresponding time will be displayed under Selected Time.

Fig.23: Dose/Shelf Input

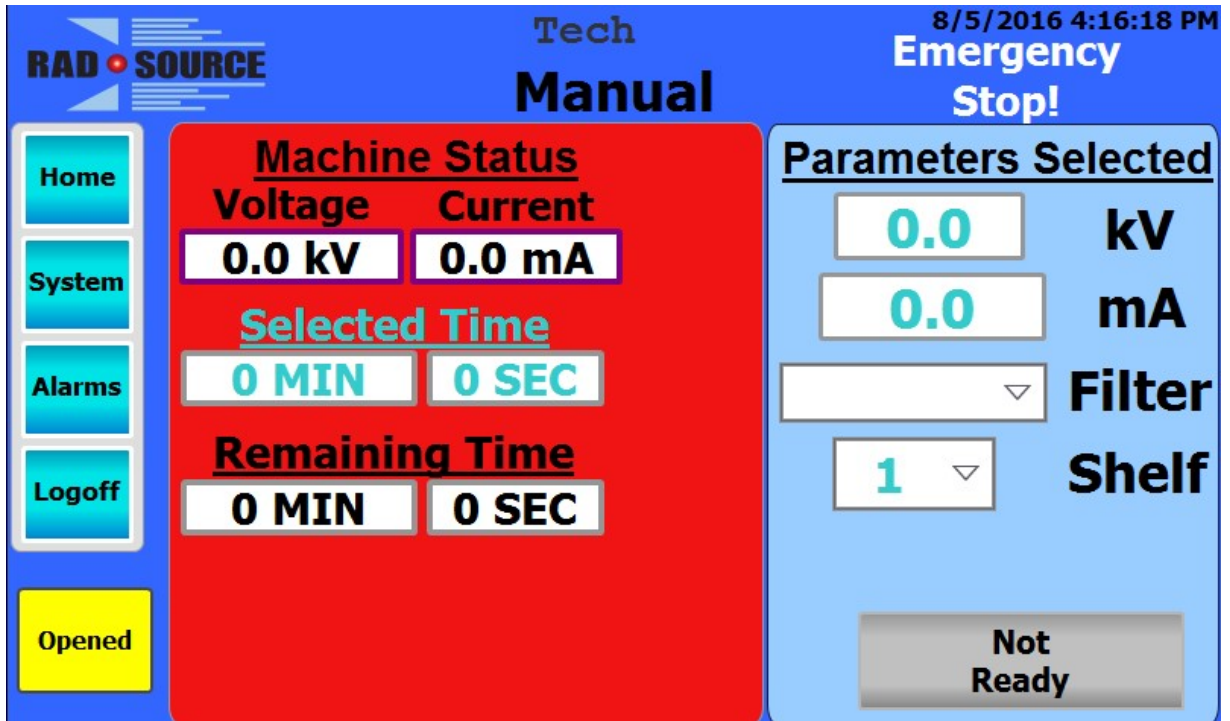


3. Press Unlock Door, open the door, and load your sample.
NOTE: A four second delay is required for the door to self-lock however; starting the run will also lock the door.
4. Close the door.
5. Press Start and confirm start. Upon completion press Start.(See Fig. 27)
NOTE: If you decide to cancel the run, press Stop.
6. When exposure is completed the Solenoid will be unlocks and Magnet will be uncharged and the door is ready to get open.

Manual Mode [lower power option] (Admin, Writer)

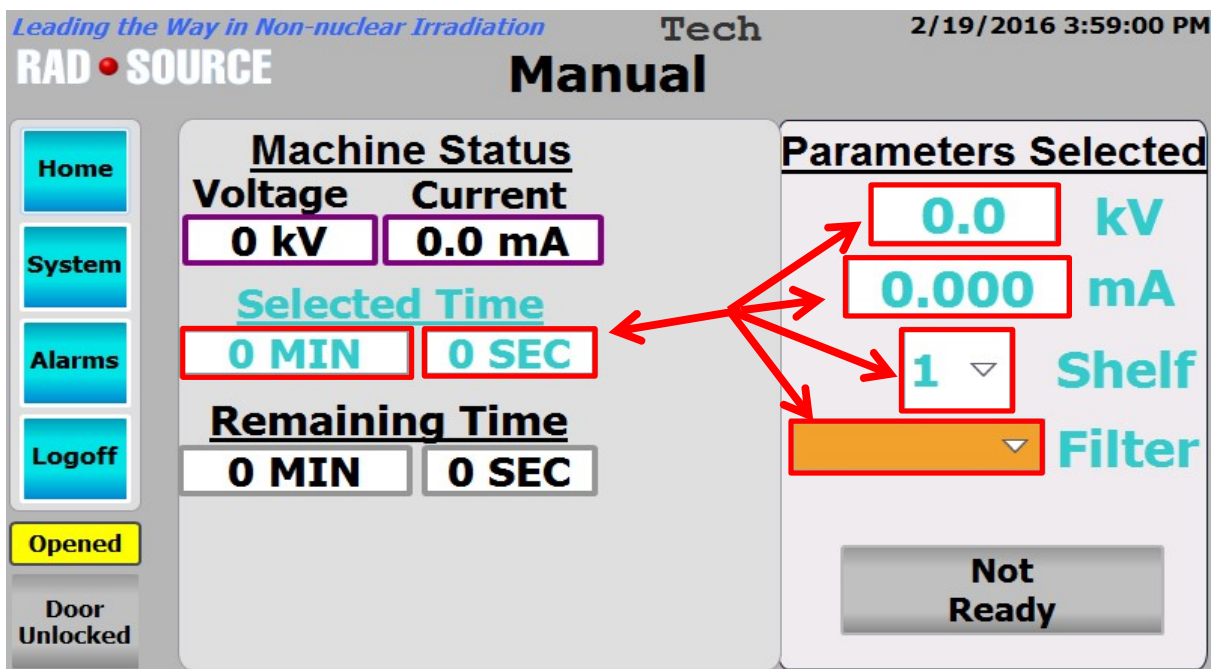
1. Press Home.(See Fig. 13)
2. Press Manual.

Fig.24: Manual Button



3. On the right, change the kV, mA, and time to the desired parameters.
NOTE: No calibrated dosage information will be available when using this setting.

Fig.25: Manual Parameters



4.
5.

6. Press Start and confirm start.(See Fig. 27)
NOTE: If you decide to cancel the run, press Stop.
7. When exposure is completed, the door unlocks, and the remaining time will equal 0.

Saving and Logoff

1. On the left, Press Logoff.
2. Insert USB storage device.
3. Press Save.
4. Remove USB storage device when prompted.
5. Press Logoff.

ALARMS: If you see alarm, press Alarms on the left of Home page and read the prompt. Press Reset Alarms in the bottom right to clear the screen and alarm.

Fig.26: Alarms Button

