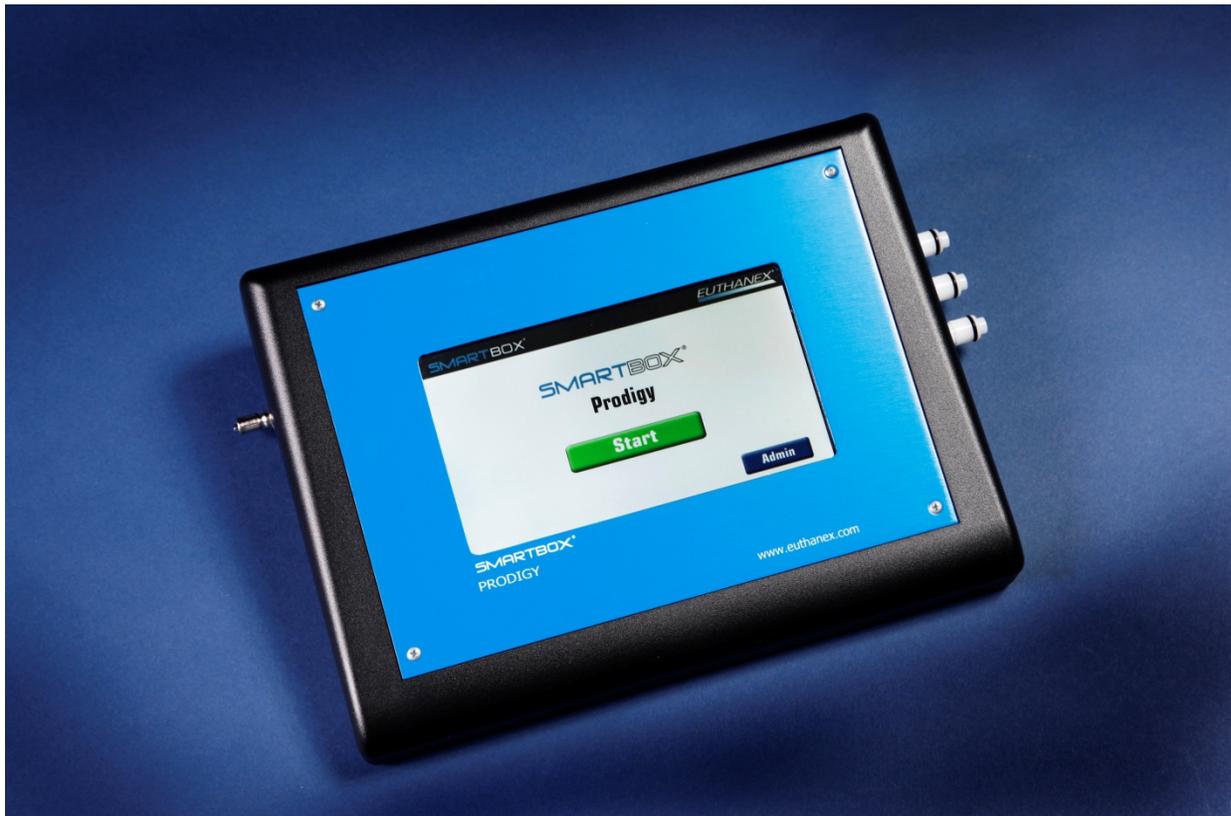


# SMARTBOX™

## Auto CO<sub>2</sub> System

PRODIGY EA-3300TS



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## **EMC / EMI.**

This equipment has been tested and found to **comply with the limits for a Class A Equipment,** pursuant to part 15 of the FCC rules.

IEC 61326-1:2005 / EZ 61326-1:2006



## ***DISCLAIMER:***

**THIS MANUAL MUST BE READ BEFORE SETTING UP AND OPERATING THE SMARTBOX AUTO CO<sub>2</sub> SYSTEM.** The user should be thoroughly familiar with the contents of this manual prior to using the system with animals. Only technicians that are properly trained should operate the system.

The user/owner of this equipment shall have the sole responsibility for any damage or injury resulting from operation that is not in accordance with the authorized instructions.

This includes, but is not limited to, operating the equipment outside of recommended safety levels, variation from specified operating instructions, and not following standard laboratory safety procedures when working with anesthetic agents and volatile compressed gases.

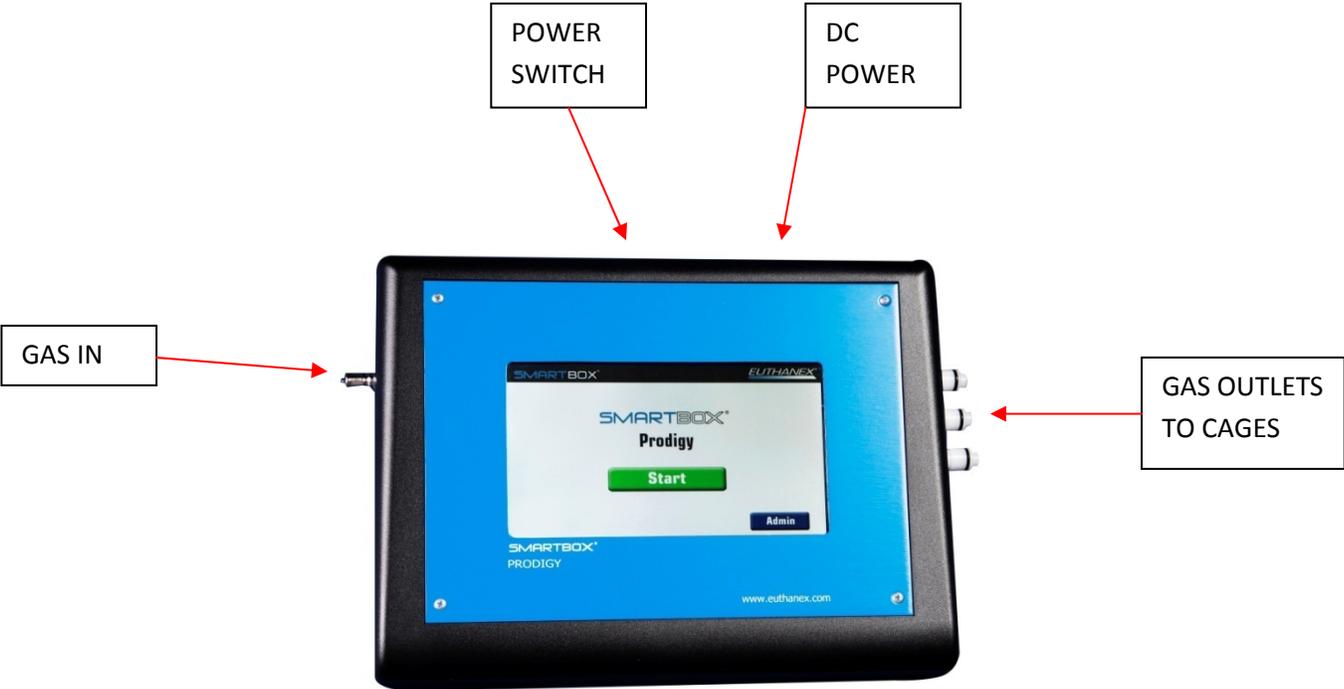
The system and its components must only be modified or repaired by Euthanex® authorized service technicians. Improper modification or repair may result in danger to personnel, harm or death to animal, and/or equipment damage. The user/owner of this equipment shall have the sole responsibility for any damage or injury resulting from improper maintenance and repair that is not done by authorized maintenance and repair personnel.

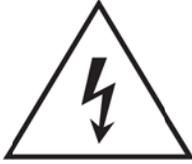
Parts that have failed, in whole or in part, exhibit excessive wear, are contaminated or are otherwise at the end of their useful life, should not be used and should be replaced with parts supplied by Euthanex Corporation. Tampering with the main control unit by unauthorized personnel automatically voids all warranties and specifications. The manufacturer assumes no responsibility for any malfunction or failure of the unit if tampering is suspected.

**OVERVIEW:**

The SMARTBOX® Prodigy allows administrators to program an unlimited number of cages and sizes. The administrator only needs to select the flow rate percentage. The EA-33000TS will automatically calculate the required flow rate. An unlimited number of password-protected users adds even more flexibility. Each user can only see the cages authorized by the administrator. The user can connect up to 3 cages at one time. The Touch Screen display shows the cycle, cycle time, and total time remaining.

Please refer to the “Flow Rate & Preset Times” section to derive the AVMA recommended flow rate.





The lightning flash with an arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this unit near water.
6. Do not clean by spraying liquid directly onto unit.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other unit that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the unit.
11. Unplug this unit during lightning storms or when unused for long periods of time.
12. Refer all servicing to qualified service personnel. Servicing is required when the unit has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the unit, the unit has been exposed to rain or moisture, does not operate normally, or has been dropped.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

**Warning!**

- To reduce the risk of fire or electric shock, do not expose this unit to rain or moisture.
- Use line cord supplied with the product.
- Be advised that different operating voltages require the use of different types of line cord and attachment plugs. The unit was shipped with the requested plug. If the installation requirements change please contact us for the correct plug.
- This equipment should be installed near the socket outlet and disconnection of the device should be easily accessible.
- Do not install in a confined space.
- Do not open the unit - risk of electric shock inside.

**Caution:**

You are cautioned that any change or modifications not expressly approved in this manual could void your authority to operate this equipment.

**Service**

- There are no user-serviceable parts inside.
- All service must be performed by qualified personnel.

Voltage	100-240 v ac 50-60hz 5 amp Max (auto select)
Pressure	175 psi max to inlet
Temp	0 to 40°C <> 10 to 85% RH (no condensation)

## **SYSTEM SETUP:**

The unit come preprogram with base setting. Additional changes can be make. Ref. to Page 12

1. The unit sits on the tabletop or can attach to a metal surface with the magnetic feet, It can also be mounted to the wall with the optional wall mounting bracket.
2. Connect the external CO<sub>2</sub> gas line from the PSI regulator or in-line PSI regulator, to the gas input of the Prodigy located on the left side. Check the Flow Rate Guide to determine the correct PSI settings.



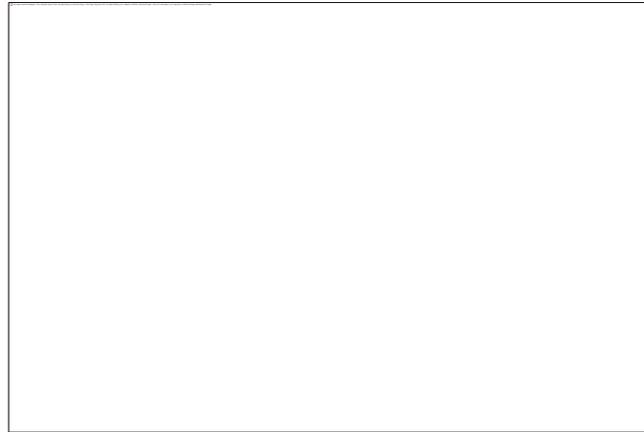
3. Connect the supplied cage hose from the output of the Prodigy (located on the right side) to the input valve on the Euthanex Lid. The unit will support operation of 3 cages in a cycle.



**GAS WILL NOT FLOW INTO LID IF THE COUPLER IS NOT PROPERLY ATTACHED.**

**WARNING - A minimum of one cage must be connected. All quick disconnect fittings are normally closed and will not open until connected. Failure to do so will cause over pressurization and may result in the safety pop off valve to erupt or internal hoses to disconnect.**

4. Place the Euthanex Lid on the cage. To properly make the connection, pull back the coupler and slide it over the male stem. The coupler will snap back into place and secure the connection. The system is ready for operation.



Mounted Heated Regulator

Set for 20 PSI out.

5. Attach the heated regulator to the CO<sub>2</sub> tank. It is recommended that Teflon tape be used on the CO<sub>2</sub> tank threads before attaching regulator. Use a wrench to tighten the mounted regulator. **Set for 20 PSI out.**

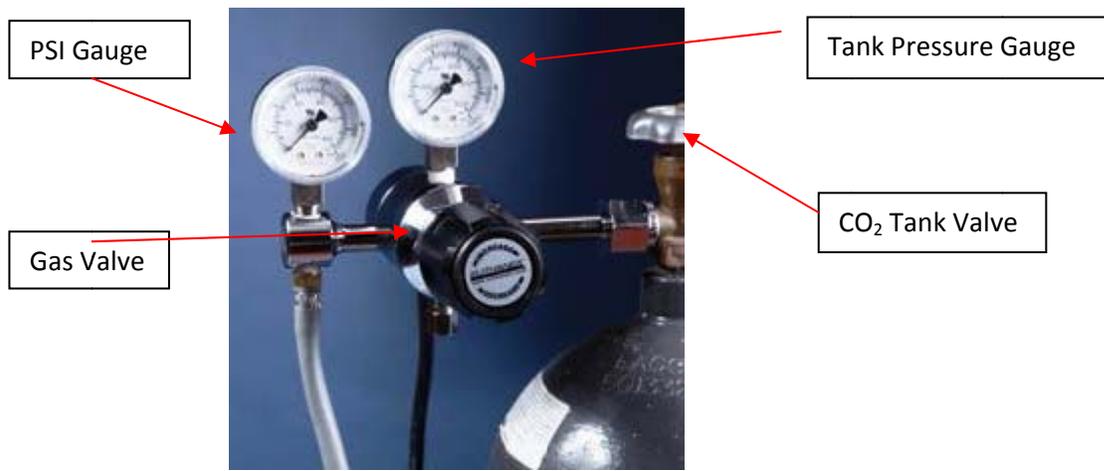
**We recommend setting the incoming pressure to 20 PSI but do not exceed 35 PSI. The unit will work on low incoming pressure but may result in the inability to achieve higher output flow rates.**

**Note: The EA-550 Electrically Heated Regulator is recommended to operate the system. Using a non-heated regulator will likely result in frozen CO<sub>2</sub> lines.**

**Setup is now complete.**

## **OPERATING THE SYSTEM:**

- 1) Press the On switch in the back of the unit. The unit will boot and come to the home screen ready for use. If this is the first time using the system the operating parameters must be setup prior to running any cycles (see administrator instructions pg 13).
- 2) Ensure the lid(s) has been placed on the cage(s) and hoses are correctly attached to the unit.



- 3) Open the gas flow from the CO<sub>2</sub> tank by turning the tank valve knob counterclockwise. The large PSI gauge should be reading 800 -850 PSI if the tank is full, less if it is not a full tank.
- 4) Open the gas flow out of the regulator by turning the control bar counterclockwise. This begins the flow of gas to the controller.



**Set the regulator to 20 PSI.**

**WARNING - A minimum of one cage must be connected. All quick disconnect fittings are normally closed and will not open until connected. Failure to do so will cause over pressurization and may result in the safety pop off valve to erupt or internal hoses to disconnect.**

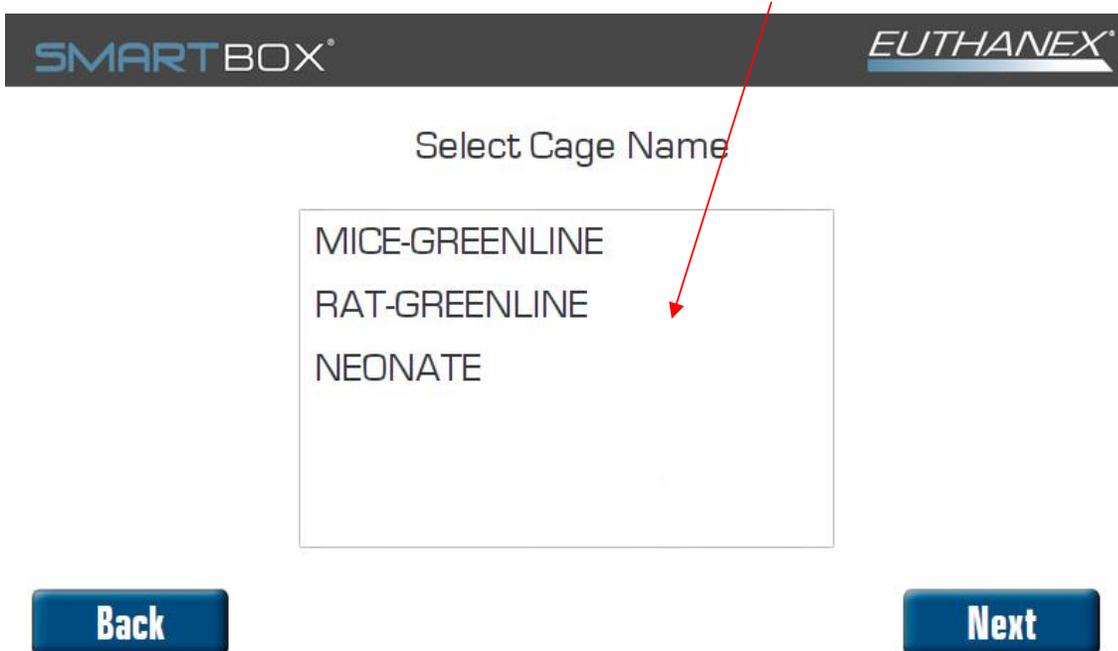
**We recommend setting the incoming pressure to 20 PSI but do not exceed 35 PSI. The unit will work on low incoming pressure but may result in the inability to achieve higher output flow rates.**

5) From the Home Screen press "Start".

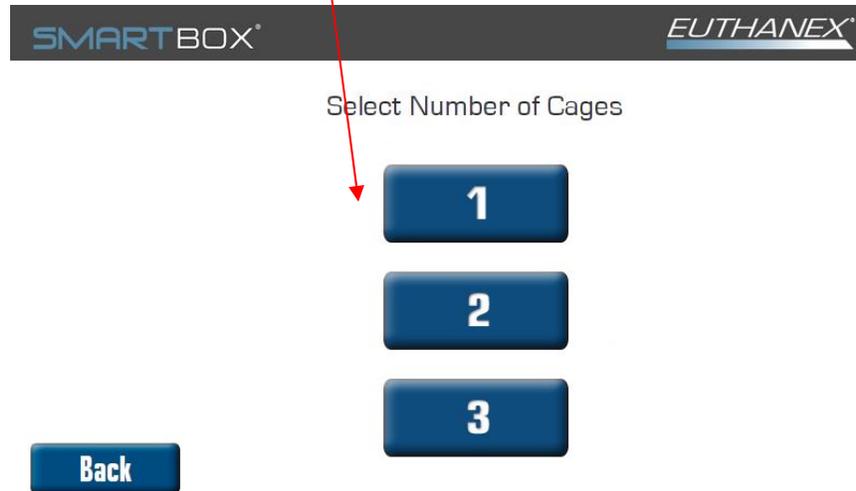


If passwords are activated the next screen will be password enter.

6) Select the cage type by touching the screen on the cage desired . If there is a large amount of registered cages, you will need to scroll through a list to find your desired selection. Then hit next.



- 7) Next you will need to confirm the hose connection message, then select the number of cages to be used in the cycle.



**NOTE:** The system supports up to 13 lpm @ 20 PSI. If multiple large volume cages are selected and the flow rate is exceeded, the system will automatically adjust the cage number for the allowable amount of connected cages.

- 8) The system will cycle through two stages:

**Stage 1 Charge:** Gas flows to the cages, fully charging them with CO<sub>2</sub>.

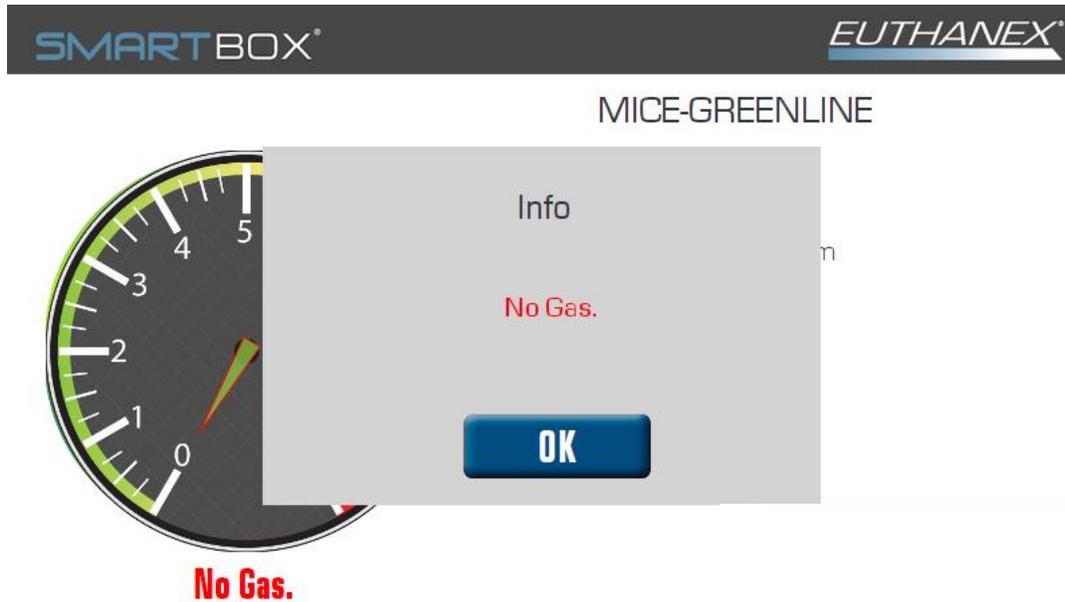


**Stage 2 Dwell:** Gas flow stops and the cages remains fully charged with CO<sub>2</sub>.

**Option:** If programmed, the system will perform a second CO<sub>2</sub> charge and dwell cycle.

- 9) The red emergency “STOP” icon may be pressed at any time to stop the euthanasia cycle. A password may be required to engage the stop (admin setting). Gas flow will immediately cease.

NOTE: If there is no gas pressure on the inlet of the unit due to the hose not being connected or the supply has run out, the below screen will appear.



## **ADMINISTRATOR INSTRUCTIONS:**

### **Changing Operating Specifications**

Default flow rates and times were chosen to comply with the latest guidelines of the AVMA Panel on Euthanasia and through extensive testing performed by Euthanex. Flow rates and times are programmable and may be changed by a designated administrator. Flow rates and times are password protected for security.

The Charge stage delivers the CO<sub>2</sub>, humanely euthanizing the animals. After all gas has been delivered, the Dwell stage allows the gas to remain in the chamber for a pre-set amount of time, ensuring proper euthanasia.

**CO<sub>2</sub> Time:** This determines the amount of time “CO<sub>2</sub>” is to be delivered during the euthanizing stage.

**Dwell:** After all gas has been delivered, the dwell stage allows the gas to remain in the cage for a preset amount of time, ensuring proper euthanasia.

**2<sup>nd</sup> CO<sub>2</sub> Time:** This determines the amount of time “CO<sub>2</sub>” is to be delivered during the 2<sup>nd</sup> Charge euthanizing stage.

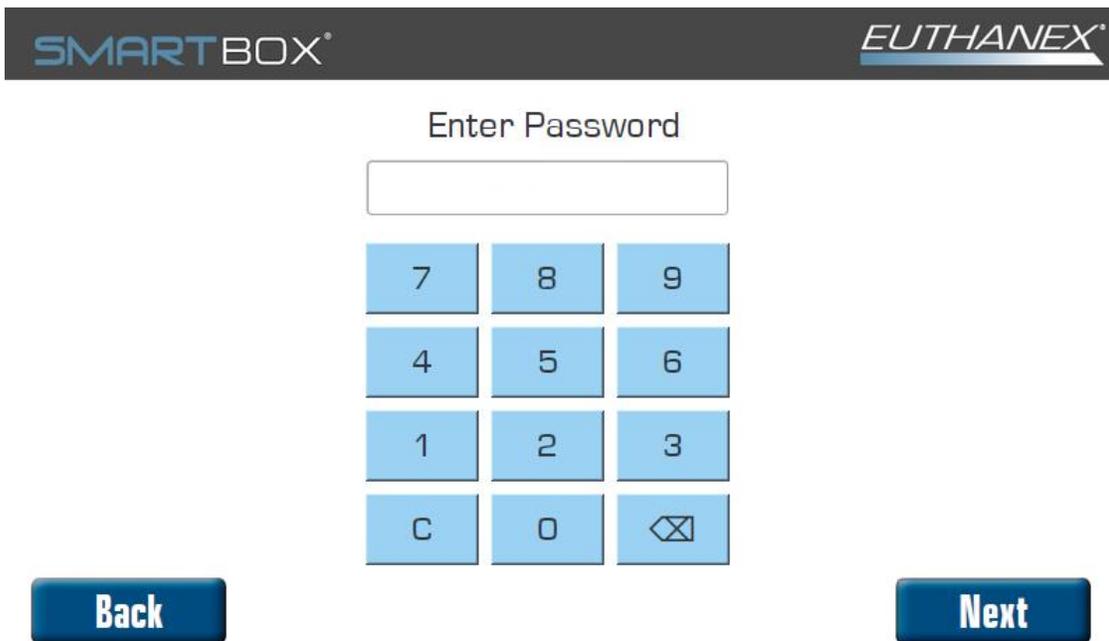
**2<sup>nd</sup> Dwell:** After gas has been delivered for the 2<sup>nd</sup> Charge, the Dwell stage allows the gas to remain in the cage for a preset amount of time, ensuring proper euthanasia.

**Flow Rate:** This is the calculate amount of gas to be delivered for the cage based on the fill rate percentage. The gas flow rate is delivered in liters per minute (lpm).

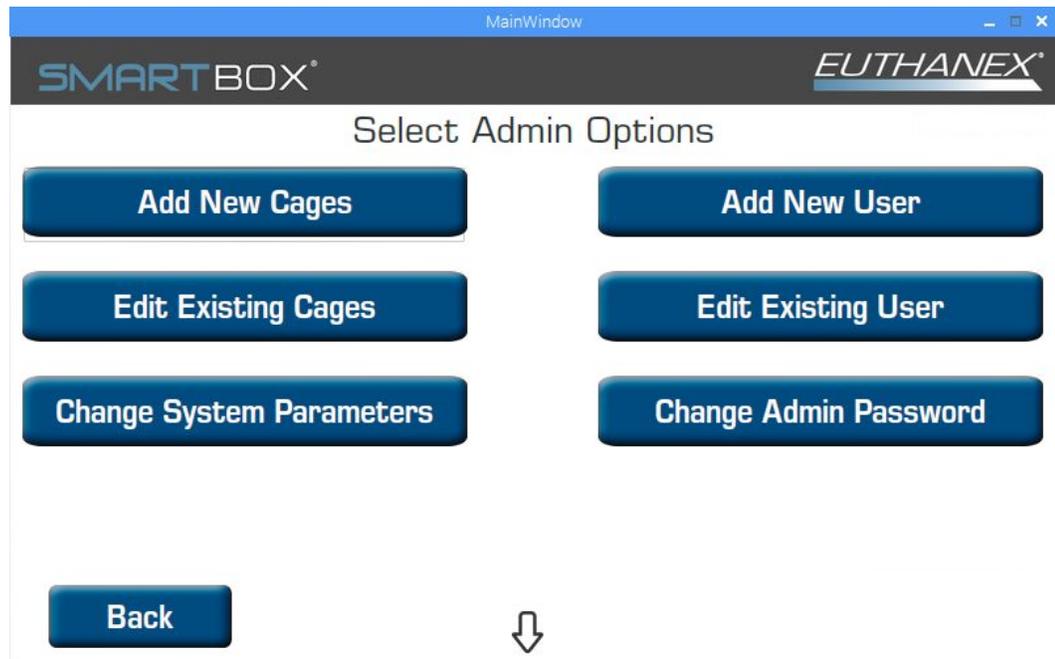
1. From the Home Screen press "Admin".



2. Enter the Administrator 4 digit password (default is 7777 and can be changed once in the admin settings screen) and press Next.



3. The Admin Options Screen will appear.



- a. Add New Cage
  - i. Use this to add new Cage types for cycle. This includes setting the cage size and desired flow rate percentage.
- b. Edit Existing Cage (Will display current settings)
  - i. Use to change operating parameters of defined cages that are already in the system.
- c. Change System Parameters
  - i. Use to change basic system settings.
- d. Add New User
  - i. Setup new user name and password.
- e. Edit User
  - i. Change user names or passwords that are already in the system.
- f. Change Admin Password
- g. The down arrow will take you out of the software to the desktop to allow for remote service connection. Please contact support.

4. To Add New Cage, select from admin screen
  - a. The add new cage screen will be displayed.

SMARTBOX<sup>®</sup> EUTHANEX<sup>®</sup>

Add New Cage

Name:

Back Next

1 2 3 4 5 6 7 8 9 0

Q W E R T Y U I O P

A S D F G H J K L ?

Z X C V B N M - + \* /

| " SPACE . , ( )

- b. Type in the label of the cage that you want to add, then hit next.

SMARTBOX<sup>®</sup> EUTHANEX<sup>®</sup>

Enter Dimensions

Length:  Width:  Height:  (Enter Dimensions in Centimeters)

Or enter Total volume (liters):

Back Next

7 8 9

4 5 6

1 2 3

. 0

- c. The cage dimensions or total volume must be entered on this screen.  
The system will calculate your cage volume based on the dimensions specified.
      - d. When input is complete press "Next".

e. The desired flow rate percentage needs to be set for the new cage type. Use the +/- to adjust the flow percentage you would like. The unit calculates your flow rate based on the cage dimensions that were entered on the previous screen. Press "Next" when set.

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Cage Name: NEWCAGE Cage volume: 0.48

Flow Rate: 0.14 lpm

Set % of Flowrate: - 30 +

Set Charge Time: - 4 + min - 0 + sec

Set Dwell Time: - 2 + min - 0 + sec

Set 2nd Charge Time: - 0 + min - 0 + sec

Set 2nd Dwell Time: - 0 + min - 0 + sec

Back Save

f. Now the times need to be set for the new cage. Use the + and – next to the times to be adjusted.

g. If a second charge is needed, Use the + and – next to the times to be adjusted for second charge input times.

h. Once the settings are correct press "Save", and it will return to the Admin screen.

5. To Edit Cage, select from Admin screen

a. Select the cages that you would like to edit from the pop-up menu, then hit ok.

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Select Cage

MICE-OPTI  
RAT---OPTI  
MB

Cancel OK

Add New User

Edit Existing User

Change System Password

Back

- b. The current parameters for the selected cage will be displayed.

The screenshot displays the SMARTBOX EUTHANEX interface. At the top, the SMARTBOX logo is on the left and the EUTHANEX logo is on the right. The main title is "Existing Cage". Below the title, the following parameters are listed:

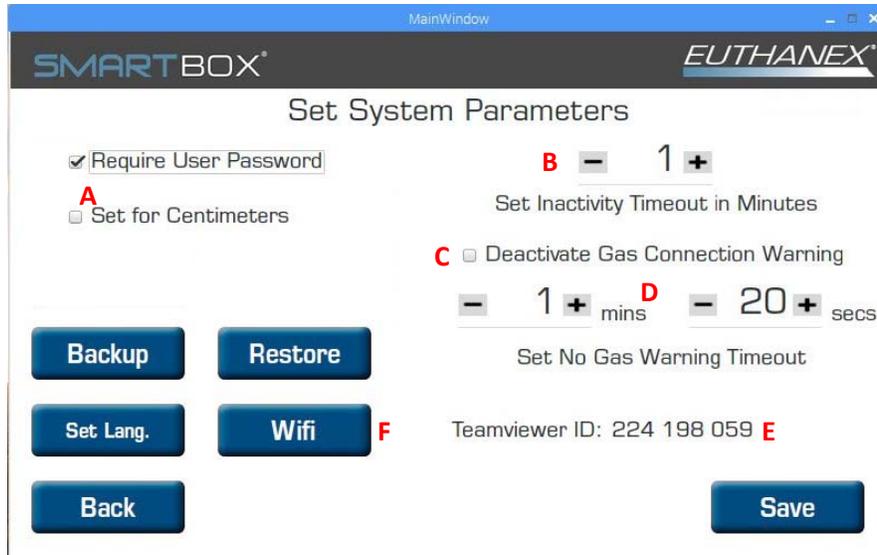
- Cage Name: MICE-OPTI
- Cage Volume: 8.00
- Flow Rate: 2.4
- Co2 Charge Time: 5 mins 0 secs
- Dwell Time: 0 mins 1 secs
- Co2 Charge 2nd Time: 0 mins 0 secs
- Dwell Second Time: 0 mins 0 secs

At the bottom of the screen, there are three buttons: "Back", "Delete", and "Edit".

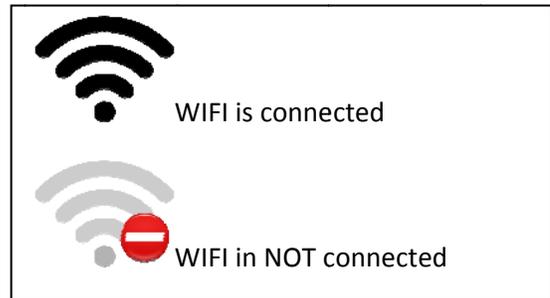
- c. To make changes select "Edit", and follow the instructions for adding a new cage.

6. Change System Parameters, select from admin screen

- a. Select if the system will require a password for user operation. **A** If this is tuned off then Set language, used to choose desired interface language.



- b. Screensaver time out setting. **B**
- c. Eliminates the gas connection warning on cycle run. **C**
- d. Gas warning On, this adjusts the time to activate the warning of no gas flow. **D**
- e. If you need us to connect to your unit for service support, this is the ID that we will need to connect to the unit. **E**
- f. WIFI settings. Used to connect the unit to your WIFI network. **F**



Select the network and security protocol then enter the password. Hit Save.

- g. Update, used to update the Prodigy software if the unit is connected to the internet.
- h. Backup / Restore, the system can be backed up to our service and support server. All of the setting parameters will be saved. You can restore the parameters at anytime as long as you are connected to WIFI.
- i. When all changes are made select Save.

7. Add New User

- a. Type in the user name that you wish to add.

SMARTBOX<sup>®</sup> EUTHANEX<sup>®</sup>

Add New user

Save Name: NEW USER Cages

Password: Password: Back

Display Emergency Stop button

Require Admin Password for Emergency Stop

Quantity

1 2 3 4 5 6 7 8 9 0

Q W E R T Y U I O P

A S D F G H J K L ?

Z X C V B N M - + \* /

! " SPACE , . ( )

- b. Set the user password.
- Select if the user will have Emergency Stop button during the cycle.
  - Select if it will require an admin password to engage. If you select to use system password, this opens the option of limiting the cages that a user may select or operation
  - Once complete hit Save.
- c. The "Require Admin Password for emergency stop" flag if checked will require the Administrator password to be entered to stop a cycle. If no check is made the user will be allowed to invoke the stop with no password during a cycle.

SMARTBOX<sup>®</sup> EUTHANEX<sup>®</sup>

Add New user

Save Name: NEW USER Cages

Password: Password: Back

Display Emergency Stop button

Require Admin Password for Emergency Stop

Quantity

1 2 3 4 5 6 7 8 9 0

Q W E R T Y U I O P

A S D F G H J K L ?

Z X C V B N M - + \* /

! " SPACE , . ( )

**NOTE:** A user can not be saved without selecting cages and cage quantities for the user.

d. Cages can be activated per user, hit the "Cages" icon.

SMARTBOX® EUTHANEX®

Add New user

Save Name: NEW USER

Password:

Display Emergency Stop button

Require Admin Password for Emergency Stop

Back

Cages

Quantity

1 2 3 4 5 6 7 8 9 0

Q W E R T Y U I O P

A S D F G H J K L ?

Z X C V B N M - + \* /

! " SPACE , . ( )

e. To activate a cage, place a check next to all the cages that the user will have access to when logged in. Hit "OK" to save.

SMARTBOX® EUTHANEX®

Save Select Authorized Cages

Delete

Back

MICE-OPTI

RAT---OPTI

MB

Cancel Clear OK

Cages

Quantity

1 2 3 4 5 6 7 8 9 0

Q W E R T Y U I O P

A S D F G H J K L ?

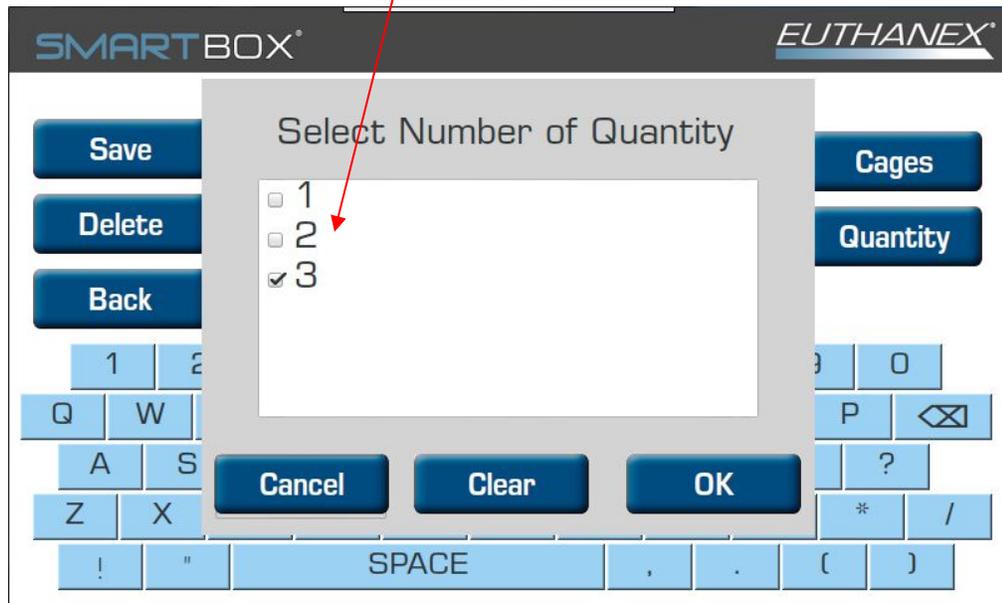
Z X C V B N M - + \* /

! " SPACE , . ( )

f. The quantity of cages that can be selected by this user can be limited by selecting the

g. "Quantity" button.

- h. To activate the quantity, place a check next to the maximum number that the user will have access to when logged in. Hit "OK", to Save.



8. Edit User

- a. Select the user that you wish to edit from the list, then hit "OK".



- b. Change User settings as desired. The user can be deactivated by touching the "Delete" box. Hit save when complete.
- c. Cages can be activated per user, hit the "Cages" icon.

- d. To activate a cage, place a check next to all the cages that the user will have access to when logged in. Hit "Done" to save.
- e. The quantity of cages that can be selected by this user can be limited by selecting the "Quantity" button.
- f. To activate the quantity, place a check next to the maximum number that the user will have access to when logged in. Hit "Done" to save.

**9. Change Admin Password**

- a. Input current Admin password, change to new password and hit "Save".

## **TROUBLESHOOTING:**



**Before any service is done that would require opening the unit it must be disconnected from the power source. If your location has lockout-tag out protocols, please follow them.**

### **System will not turn on:**

- 1) Make sure power cord is properly plugged in.
- 2) Make sure the power switch on the back of the unit is turned in the "ON" position.



- 3) Before Checking the circuit breaker located in the Prodigy, disconnect the supply power to the unit by unplugging power cord.

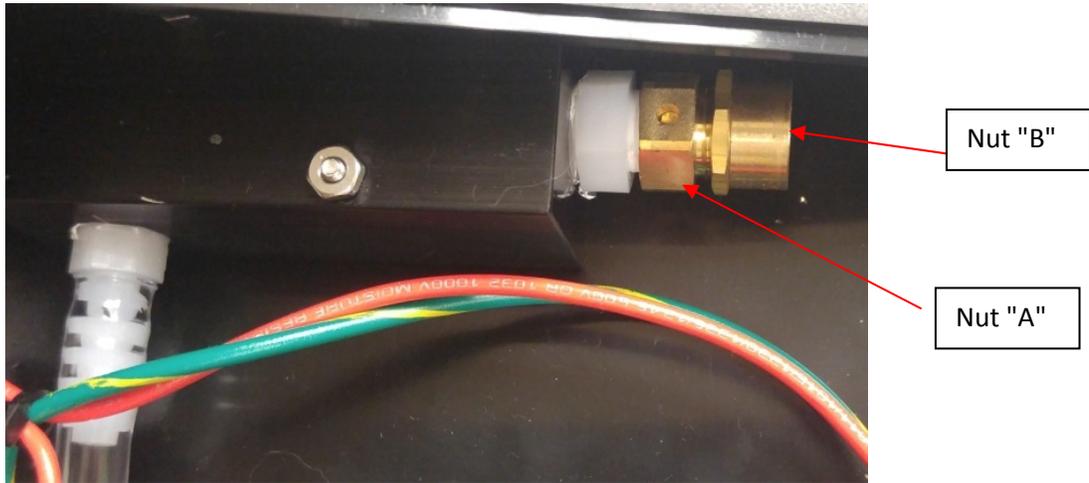
### **Gas is not being delivered to the cage or the flow rate is not correct:**

- 1) Check that your gas supply has not run out.
- 2) Check that the CO<sub>2</sub> tank valve is fully open.
- 3) Check that the connections from the gas supply regulator to the Prodigy CO<sub>2</sub> input is properly mated.
- 4) Check that the gas output hose on the right side of the Prodigy is connected to the cage input fitting. If unit was operated without hoses connected the safety valve would have opened. You will hear gas being released inside the unit. Check again that **all hoses from the Prodigy that you are going to use in the cycle must be connected to the lid/lids. Restart unit and run cycle again.**
- 5) Check that the regulator is open and set to 20 PSI.
- 6) Check that the electric heater, inline from the gas supply to the regulator, is operating. The heater runs intermittently, switching on when heat is required. If the gas is not adequately heated, it will not flow properly.
- 7) Safety Pop-off may have malfunctioned, follow these steps.
  - a. Remove the front plate. Take out the 4 screws that secure the plate to the body. Be careful



when moving the plates to avoid disconnection the wiring harness.

- b. You will need 2 x 9/16" wrenches for this next step. Place a wrench on nut "A" and Nut "B". Turn nut "B" clockwise while holding nut "A" stationary to move this jam nut. Turn nut "B" toward nut "A" till it stops. Not turn the cap by hand toward nut "A" till it stops
- c. Now tighten it back. Place a wrench on nut "A" and Nut "B". Turn nut "B" counterclockwise while holding nut "A" stationary.



***Not all animals are being euthanized after the completion of gas cycle:***

- 1) Check that all connections in the entire system are properly attached.
- 2) Check that your gas supply has not run out.
- 3) Check that the regulator is set to 20 PSI.
- 4) It may be necessary to revise settings for the particular species that you are having difficulties with. Contact Euthanex for information on this.

***System not responsive:***

- 1) Screen Saver doesn't disappear when screen is touched.

In the above please power off system at master power switch located on back of the Prodigy. Allow power to be off for at least 1 min.

***System not booting:***

- 1) Damage may have occurred to the program flash card. If you think this has happened please contact our technical support department for help with this.

If this troubleshooting guide does not resolve your problem, contact Euthanex Tech Support at 1-877-559-0159, or [info@euthanex.com](mailto:info@euthanex.com).



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