

AutoRAE Lite

User's Guide



AutoRAE Lite User's Guide

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WARNINGS

Read Before Operating

This manual must be carefully read by all individuals who have or will have the responsibility of using, maintaining, or servicing this product. The product will perform as designed only if it is used, maintained, and serviced in accordance with the manufacturer's instructions.

Proper Product Disposal At End Of Life



The Waste Electrical and Electronic Equipment (WEEE) directive (2002/96/EC) is intended to promote recycling of electrical and electronic equipment and their components at end of life. This symbol (crossed-out wheeled bin) indicates separate collection of waste electrical and electronic equipment in the EU countries. This product may contain one or more Nickel-metal hydride (NiMH), Lithium-ion, or Alkaline batteries. Specific battery information is given in this user guide. Batteries must be recycled or disposed of properly.

At the end of its life, this product must undergo separate collection and recycling from general or household waste. Please use the return and collection system available in your country for the disposal of this product.

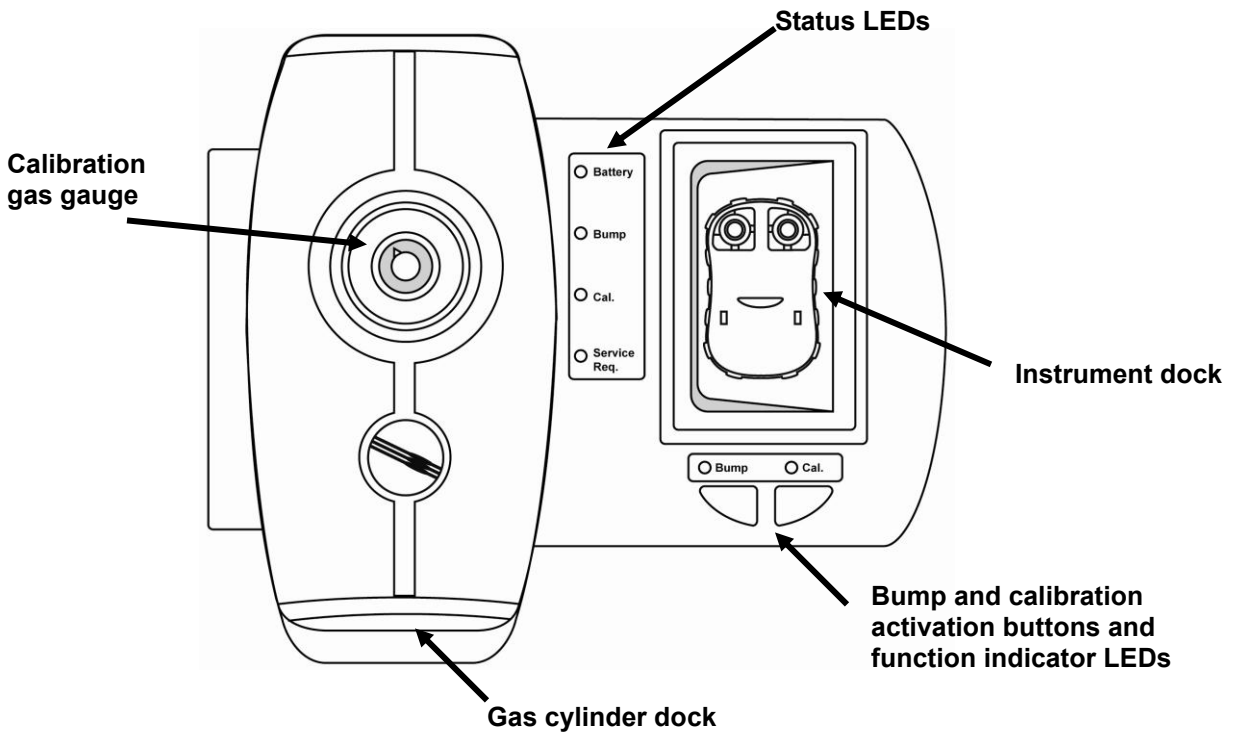
Make Sure Firmware Is Up To Date

For best operation, make sure your monitors and AutoRAE Lite are running the latest firmware.

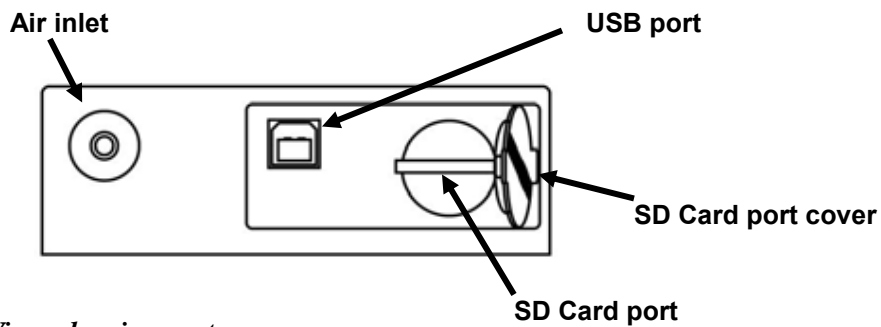
AutoRAE Lite User's Guide

1 Overview

The AutoRAE Lite is an automated bump testing/calibration station designed for performing bump tests and calibration of ToxiRAE 3 monitors. It can be used on a tabletop (or other flat surface) or mounted on a wall. Wall-mounting instructions are included in this guide. In addition, it can be powered by either an AC adapter or four alkaline C-cell batteries.



Front View (gas cylinder removed)



Bottom View, showing ports

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Standard Kit

The AutoRAE Lite is shipped with the following:

- AutoRAE Lite, as specified, P/N T01-0901-000
- USB cable for PC connection, P/N 410-0086-000
- 12-volt power supply, P/N 500-0036-100
- Demand-flow regulator, P/N 490-0053-000
- SDHC memory card, P/N 550-0301-000
- Quick Start Guide, P/N T01-0901-000D
- Inlet filter, P/N 002-3022-000*
- CD-ROM, P/N 000-0T01-000. This disc includes:
 - Operation Manual
 - Drivers
 - Utility Software

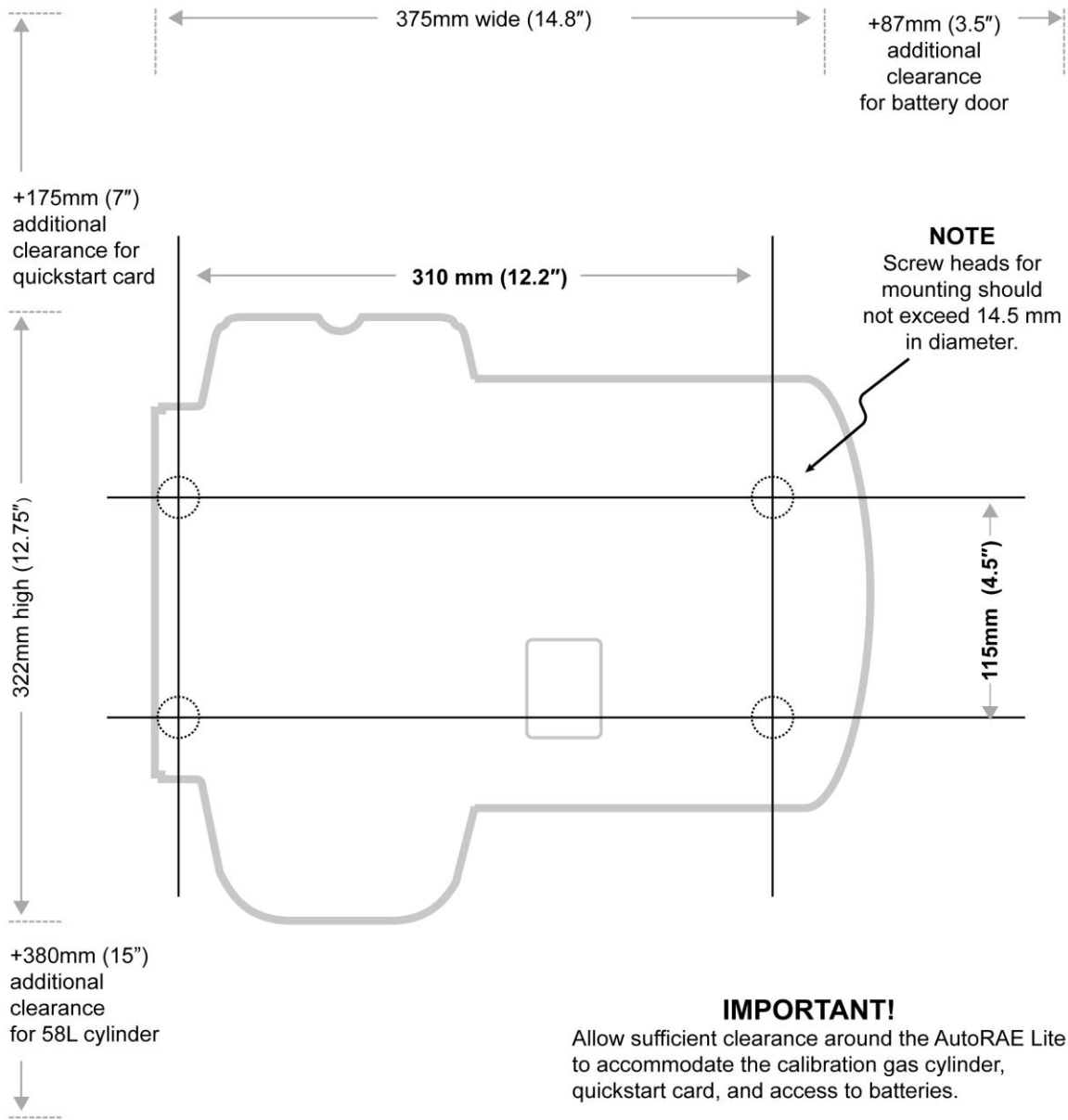
* Replacement filters are sold in packages of 5, P/N 002-3022-005.

2 Mounting The AutoRAE Lite On A Wall

The AutoRAE Lite can be used on a flat surface, or it can be mounted on a wall. This requires drilling four holes into the wall and inserting screws to hold the AutoRAE Lite.

Important! Make sure the wall is strong enough to support the weight of the AutoRAE Lite and a cylinder of calibration gas. If necessary, mount a piece of plywood or use other reinforcement for the wall.

Note: This diagram is not a full-scale template. It is only intended to provide measurements for drilling and clearances.



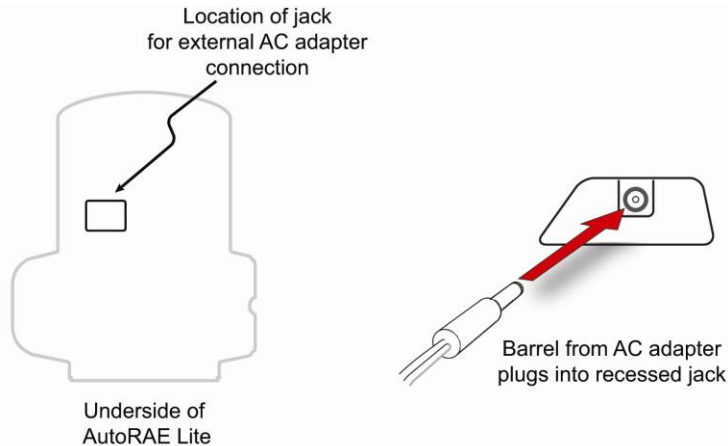
Total clearance width: 525mm (21")
Total clearance height: 702mm (27.75")

3 Powering The AutoRAE Lite

The AutoRAE Lite can be powered by its AC adapter or by four C-size alkaline batteries.

3.1 AC Adapter Power

The jack for the AC adapter connection is in the recess on the underside of the AutoRAE Lite.



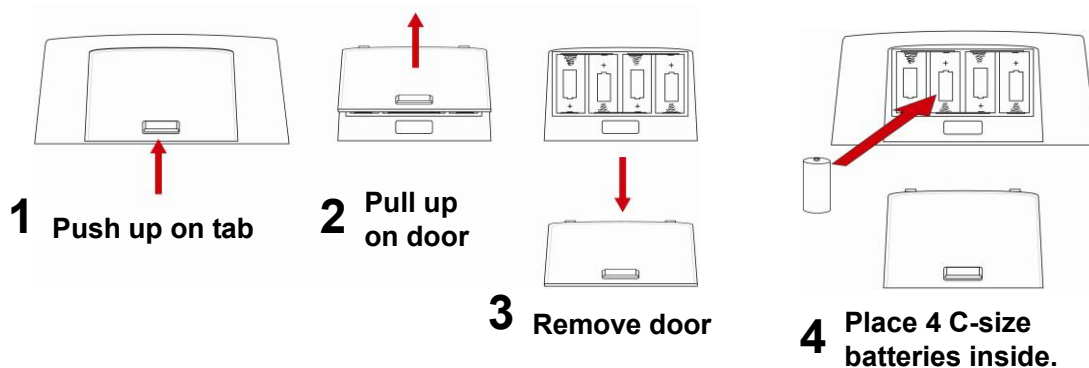
Caution: Never use the AutoRAE Lite or its AC adapter in wet or damp environments. Do not use outdoors in unprotected locations.

3.2 Battery Power

You may use four C-size batteries instead of the AC adapter. Always use high-quality alkaline batteries.

The battery compartment is located on the end of the AutoRAE Lite. Open and remove the door by pulling up on the latch and lifting. When inserting the batteries, be sure to follow the polarity markings indicated in the compartment. After all four batteries are installed, replace the cover.

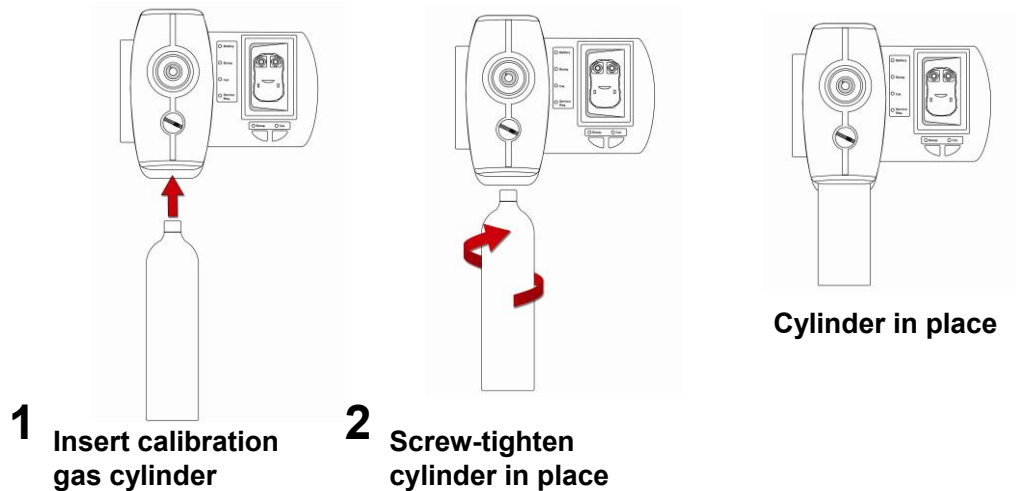
Important! Rechargeable batteries can be used instead of alkaline batteries, but they cannot be recharged by the AutoRAE Lite. They must be recharged in an external charger.



4 Connecting Calibration Gas

Installing a cylinder of calibration gas is a simple operation. Place the cylinder in the gas cylinder dock and then turn it clockwise until it is snug.

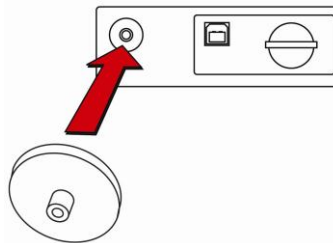
Once the cylinder is attached, the gauge should immediately give a reading. The reading should be equal to or greater than 50 psi (approximately 345 kPa or 3.45 bar). If the reading is lower, then the tank may not have sufficient contents. When it is empty, or calibration cannot be performed due to low pressure, it should be replaced..



Note: The AutoRAE Lite is designed to accommodate a 58L cylinder of calibration gas. It can also accommodate a 34L cylinder, but an adapter sleeve is recommended in order to keep the cylinder securely docked in the AutoRAE Lite.

5 Air Filter

In order to ensure that fresh air is uncontaminated by dust or other materials, use a filter on the AutoRAE Lite's fresh air inlet. The inlet is located on the bottom of the AutoRAE Lite, to the left of the USB and SD card ports. The filter's part number is 002-3022-000 (sold in packs of 5, part number 002-3022-005 with 5 metal connectors). Inspect the filter periodically and replace it as necessary.



6 SD Memory Card

The AutoRAE Lite electronically stores records of all bump tests and calibrations on an SD memory card (RAE Systems part number 550-0301-000).

IMPORTANT!

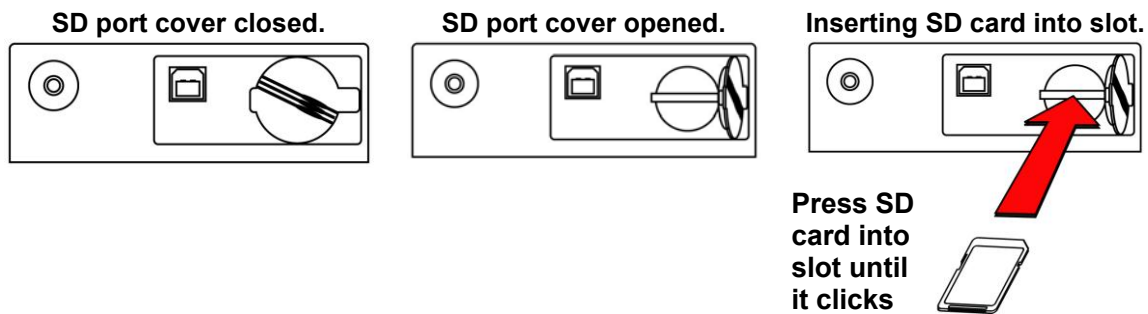
The SD card that comes with the AutoRAE Lite is pre-formatted and ready for use. If you purchase additional SD cards or SDHC cards from other sources, they may need to be formatted before they can be used in the AutoRAE Lite. Refer to Formatting An SD Card on page 41 for details.

Note: The SD card inside AutoRAE Lite can only be used for AutoRAE Lite recording. Do not save other files to the SD card.

Transferring records from the SD card to a PC on a regular basis is recommended. This enhances data security and speeds the data-transfer process.

IMPORTANT!

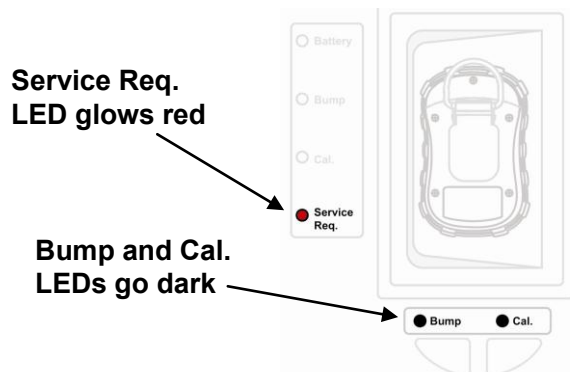
The AutoRAE Lite cannot perform a bump test or calibration without an SD card in its slot.



Inserting an SD card. Press the SD card into the slot with the angled notch on the right. Press until it locks into place, making a “click” sound.

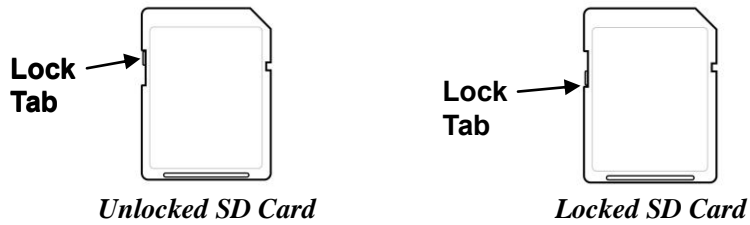
Removing an SD card. Press the SD card and release it. It will make a click and push part of the way out of the slot.

When an SD card is in the slot, the Service Request LED is off. When the ToxiRAE 3 is placed in the AutoRAE Lite, the Bump and Cal. LEDs glow green. If no SD card is in the slot, the AutoRAE Lite's Service Request LED glows red.



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If the SD card is locked, the Service Request LED glows orange and blinks. The AutoRAE Lite cannot write data to a locked SD card. Remove the SD card and unlock it by moving the lock tab; then reinsert the SD card.



If remaining space for data on the SD card is very low, the “Service Request” LED glows orange and blinks or glows red continuously. Replace the SD card with another with more space on it, or offload the data to a computer. Then erase the data from the card, using your computer, and reinsert the SD card back into the AutoRAE Lite.

IMPORTANT!

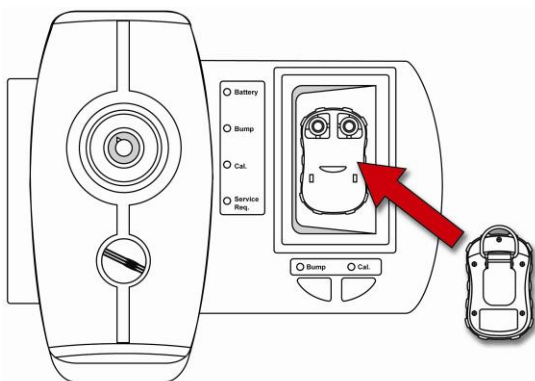
Keep SD port cover closed whenever an SD card is not being inserted or removed. This helps to keep the reading mechanism and the SD card clean, especially in dusty environments.

Keep SD cards and the lower portion of the AutoRAE Lite away from magnets. Magnets can corrupt the data on an SD card.

7 Bump Testing & Calibration

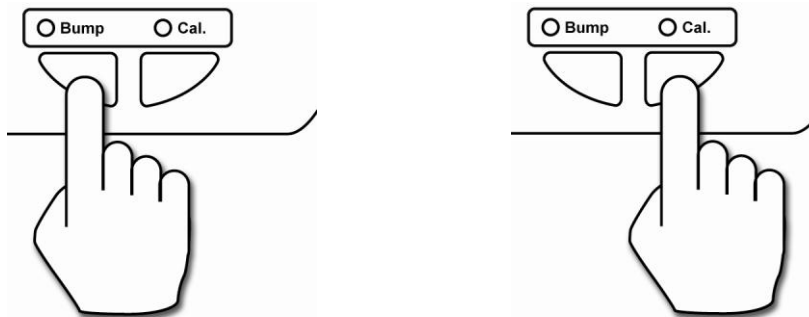
Before using the AutoRAE Lite, do the following checkout:

- Make sure the calibration gas cylinder is attached and that the pressure gauge reads >50 psi.
 - Make sure the power LED is glowing green.
 - Make sure the air inlet is not blocked, and that a filter is attached.
1. Turn on the ToxiRAE 3: Press and hold its [MODE] button.
 2. After the ToxiRAE 3 has started and displays a reading, press the [Y/+] button until its display shows "Ir."
 3. Firmly press the ToxiRAE 3 face-down in the dock on the AutoRAE Lite.



The two LEDs above the buttons should glow green. If not make sure the ToxiRAE 3 is firmly seated.

4. Press "Bump" to perform a bump test, or press "Cal." to perform a calibration.



Note: During a bump test or calibration, the LED above the button turns off and the Bump status or Cal. status LED blinks and is orange.

You will be alerted when the bump test or calibration is complete. When the two indicator LEDs above the buttons glow green, remove the ToxiRAE 3 from the dock.

Pass: A green LED indicates the bump test or calibration was successful.

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Fail: A red LED indicates the bump test or calibration failed.

If a bump test or calibration fails, check the calibration gas pressure and try again. If it fails again, it is possible the sensor is depleted and must be replaced.

7.1 Status LED Explanation

LED	Red	Green	Solid Orange	Blinking Orange
Power	Battery low, no external power	External power or battery OK	N/A	N/A
Bump	Fail	Pass	N/A	Processing
Cal.	Fail	Pass	N/A	Processing
Service Request	No SD card, or communication failure, or SD card space is very low	N/A	N/A	SD card is locked or needs to be formatted, or SD card space is very low

Whenever a bump test or calibration is performed, the buzzer and LEDs on the ToxiRAE 3 are tested. If the instrument passes the tests for the buzzer and LEDs, then there is no special indication. However, if either the buzzer or LEDs test fails, the Bump LED glows green and the Service LED glows red.

8 Transferring Data

Bump test and calibration data is collected each time a ToxiRAE 3 is bump tested or calibrated. The AutoRAE Lite collects this data and event data and stores it on an SD Card, providing a convenient means of storage and easy data transfer.

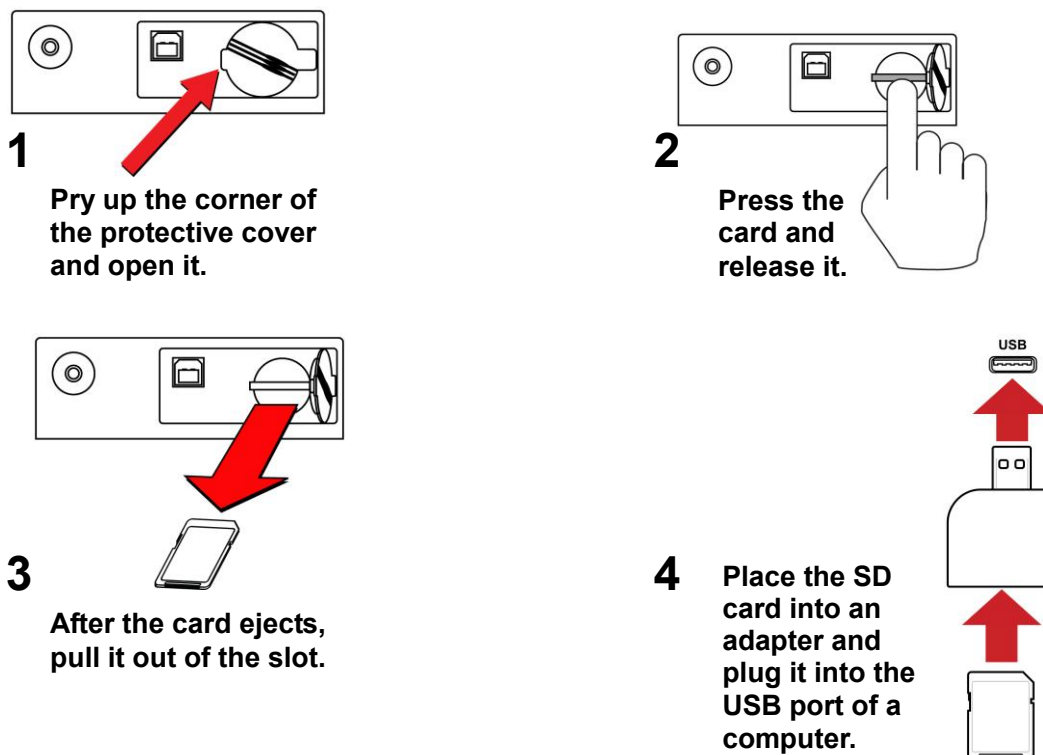
8.1 Transferring Data From The SD Card To A Computer

The data stored on the SD card in the AutoRAE Lite is in standard ASCII text format, making it easy to import into most spreadsheet and word-processing programs. In addition, it is in CSV (comma-separated value) form, so that it can be easily put into existing spreadsheets (such as Microsoft Excel®) or into columns in word-processing programs.

Important! In order for AutoRAE Lite to work correctly, it is recommended that you clear the SD card's (30 days maximum).

Some computers and external hard drives have ports that accept SD cards directly. For computers that do not have an SD port, inexpensive converters designed to accept an SD card and plug into a USB input are widely available (at electronics stores, camera stores, etc.).

Follow this procedure for removing the SD card from the AutoRAE Lite and connecting it to a computer for data transfer:



WARNING!

Do not remove the SD card from the AutoRAE Lite during a bump test or calibration. After the two LEDs above the buttons glow green, it is safe to remove the SD card.

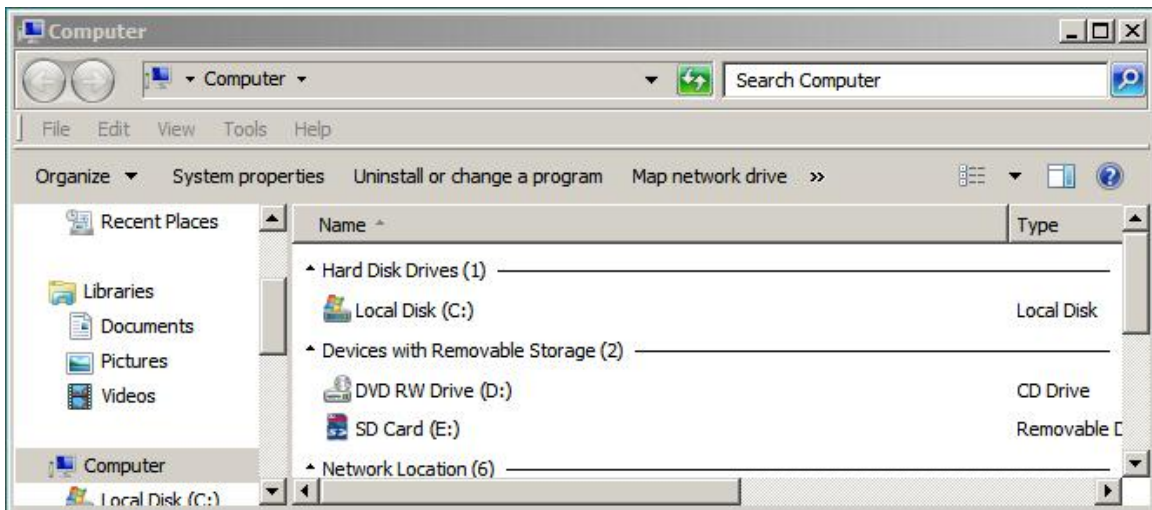
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Once the SD card is in the adapter and connected to the computer, it should show up as an external device or a drive.

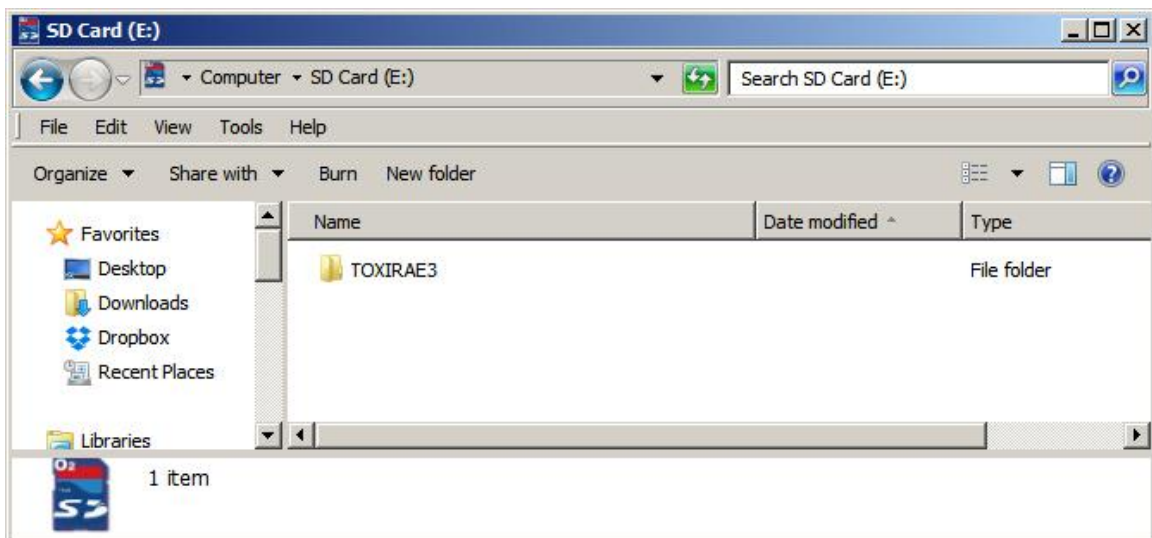
1. Double-click the Computer icon on your desktop.



When it opens, you should see a list of drives, including your C:, where most programs reside, and the external device holding the SD card.

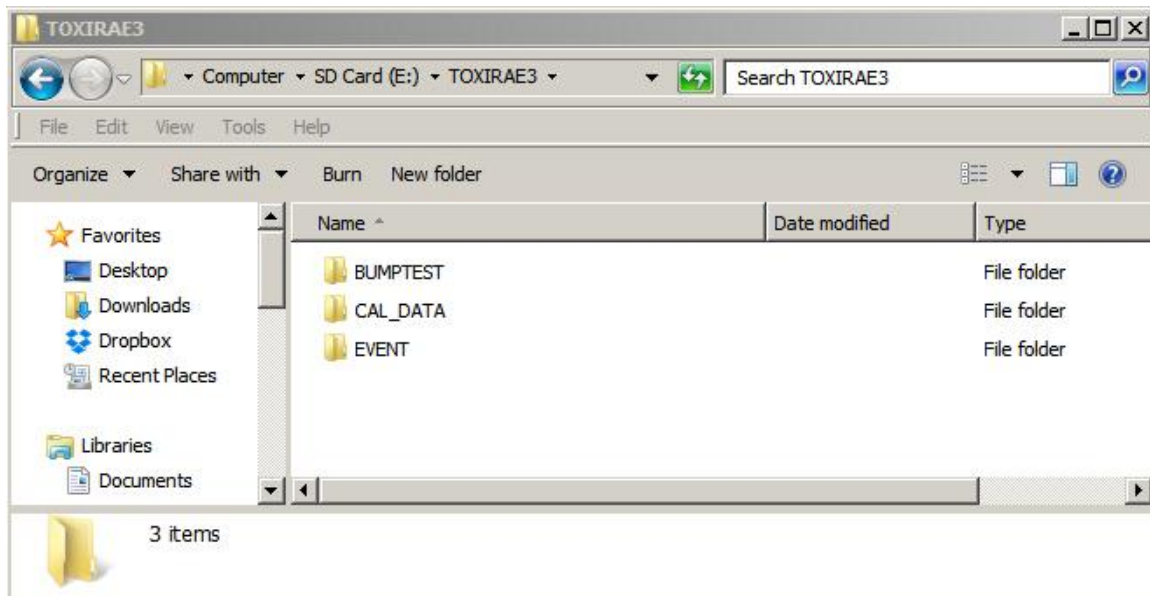


2. Double-click on the name of the device to open its directory.

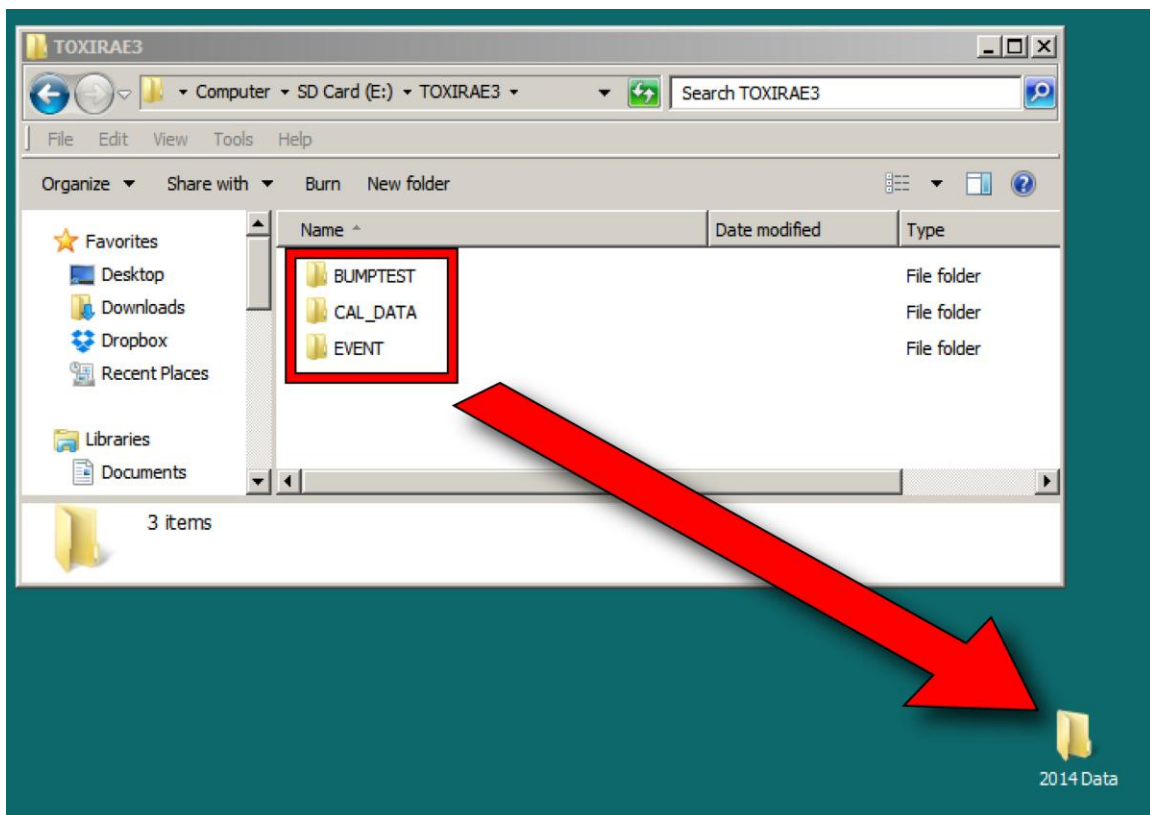


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3. You now see three folders containing files created each time the AutoRAE Lite was turned off or the SD card was inserted.



4. Create a new folder on your desktop or elsewhere on your computer.
5. Drag the file(s) from the SD card into the folder on your computer:



6. Open the folder to make sure the files have transferred correctly.

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Inside each folder is a file with an 8-character name that starts with the letter of the type of file (bump test, calibration data, or events). The first two digits indicate the year, the second two digits indicate the month, and the ending of “_V1” is a reserved tag. For example, an events file appears like this:

E0802_V1

This indicates that it is an event log from the year 2008, and the month February.

Note: Once the files are transferred from the SD card to your computer, you may change the name of the file to suit your needs. For instance, you may want to append the date and/or time to the name (for example, “E0802_V1_February12_08:15,” to indicate that it was offloaded on February 12 at 8:15AM).

8.2 After Transferring Data From The SD Card

Once you have transferred the files from the SD card to your computer, you can open them in a spreadsheet program (such as Microsoft Excel) or in a word-processing program (such as Microsoft Word). You should open them as soon as possible to make sure that all of the data transferred properly and was not corrupted.

You can place the SD card back into the AutoRAE Lite and resume collecting data from bump tests and calibrations. New files will not overwrite old ones.

If the SD card is full, or you want to retain it as a physical archive for future reference or backup, you can replace it with any SD card. Typically, 1GB is a good minimum size. When keeping an SD card for longterm storage, it is a good idea to lock the card (move the tab on the left side of the card to the “locked” position). This ensures that if it is put into a computer or AutoRAE Lite, data cannot be written to it.

Another option is to erase the SD card. To erase the data, follow these steps:

1. Make sure the locking tab on the SD card is in the “unlocked” position.
2. Insert it into the computer or the adapter (and plug that into the computer).
3. Once the SD card is in the adapter and connected to the computer, it should show up as an external device or a drive.
4. Double-click the Computer icon on your desktop.



5. When it opens, you should see a list of drives, including your C: and the SD card (shown as a device).
6. Double-click on the name of the device to open its directory. You now see a list containing files.
7. Select and drag all the files to the trash. Alternatively, you can select the files, right-click with your mouse, and select Delete.

9 Using AutoRAE Lite With The AutoRAE Lite Utility Program

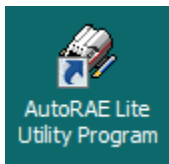
When connected to a computer with a USB cable, the AutoRAE Lite's parameters can be viewed. In Administrator Mode, parameters can be changed. These include synchronizing the AutoRAE Lite's time to match the computer's clock.

In addition, the AutoRAE Lite Utility Program allows you to view the parameters set for a ToxiRAE 3 when it is placed in the AutoRAE Lite's dock. In Administrator Mode, it is possible to store and load configuration files. This allows you to save one set of parameters and load them into as many ToxiRAE 3 monitors as you want.

9.1 Computer Setup And AutoRAE Lite Utility Program Installation

1. Install the USB driver, following the instructions on the RAE Systems website or on the utilities disc that accompanies your AutoRAE Lite.
2. Install the AutoRAE Lite Utility Program on your computer. Follow the instructions after downloading the program from the RAE Systems website or after you insert the disc into your computer.

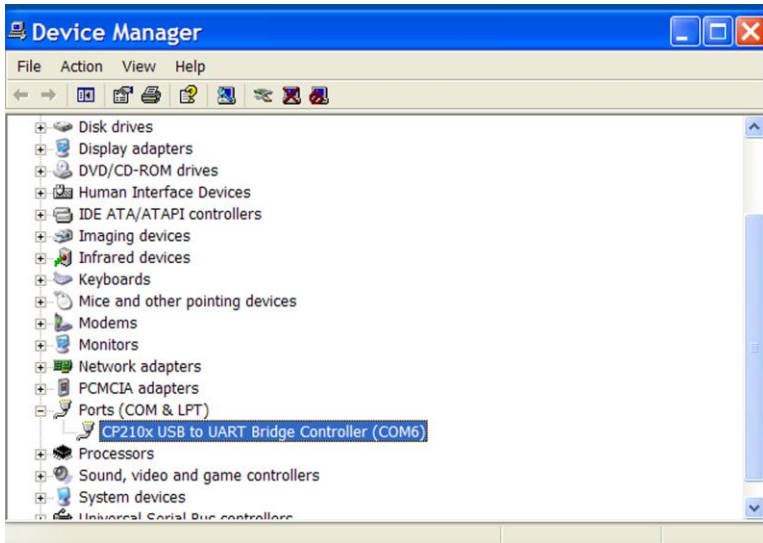
Once installation is complete, there should be an icon for it on your desktop, indicating that the program is ready for use:



3. Connect the AutoRAE Lite to a computer using a USB cable.
4. Configure your computer's port. Follow this path: Start >> Control Panel >> System>>Device Manager. You should see a list of devices in and attached to your computer.
5. Scroll down the list until you see "Ports."

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6. Open Ports (click on the “+” to the left of it) and you should see the port for the AutoRAE Lite, plus its port number (for example, COM6). Write down this port number; you will need it when you start AutoRAE Lite Utility Program.



7. Close Device Manager and System Properties.
8. Double-click the AutoRAE Lite Utility Program icon on your desktop to start the program.

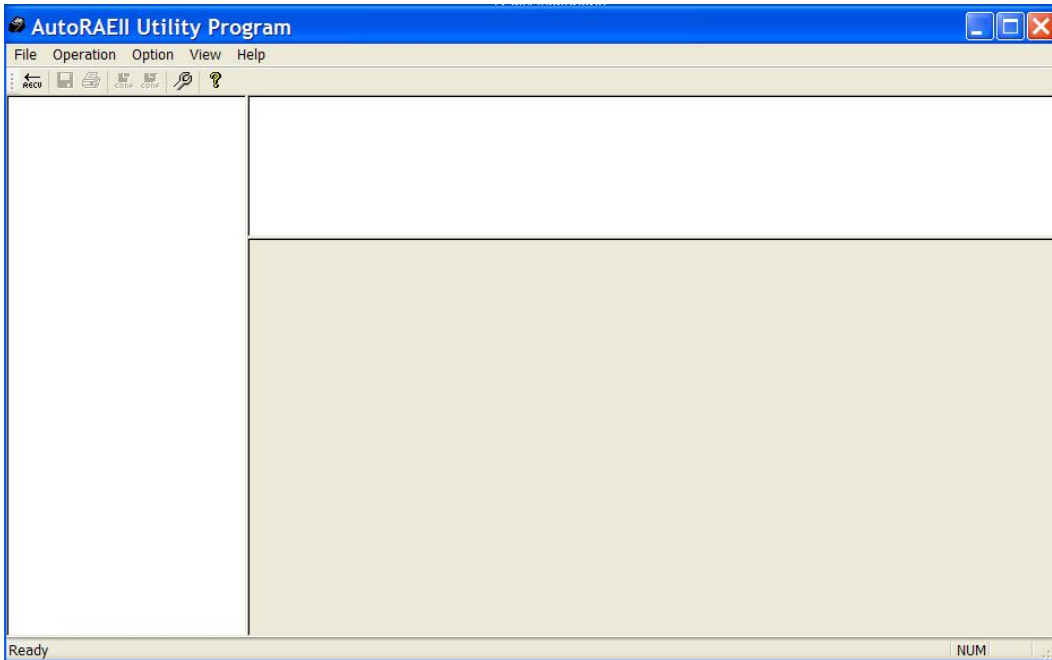
9.2 Configuring The Port For The AutoRAE Lite Utility Program

Before configuring your computer's port, make sure the AutoRAE Lite is on and that the USB cable between it and the computer is connected.

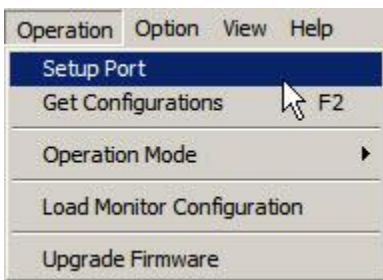
Double-click the AutoRAE Lite Utility Program icon on your desktop to start the program.



When the AutoRAE Lite Utility Program opens, you see this screen:

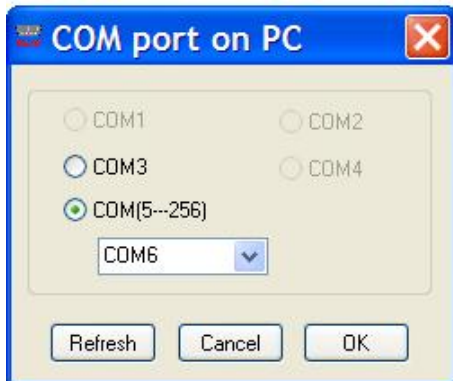


Pull down "Operation" and select "Setup Port."



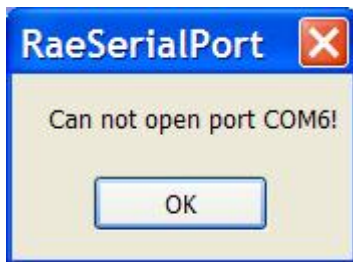
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The COM port may be selected already. Otherwise, click the “COM(5-256)” button with your mouse. Type in the COM port setting you found when you went into the computer's System Properties.



Click “OK.”

Note: If there is a problem, you will see this message:



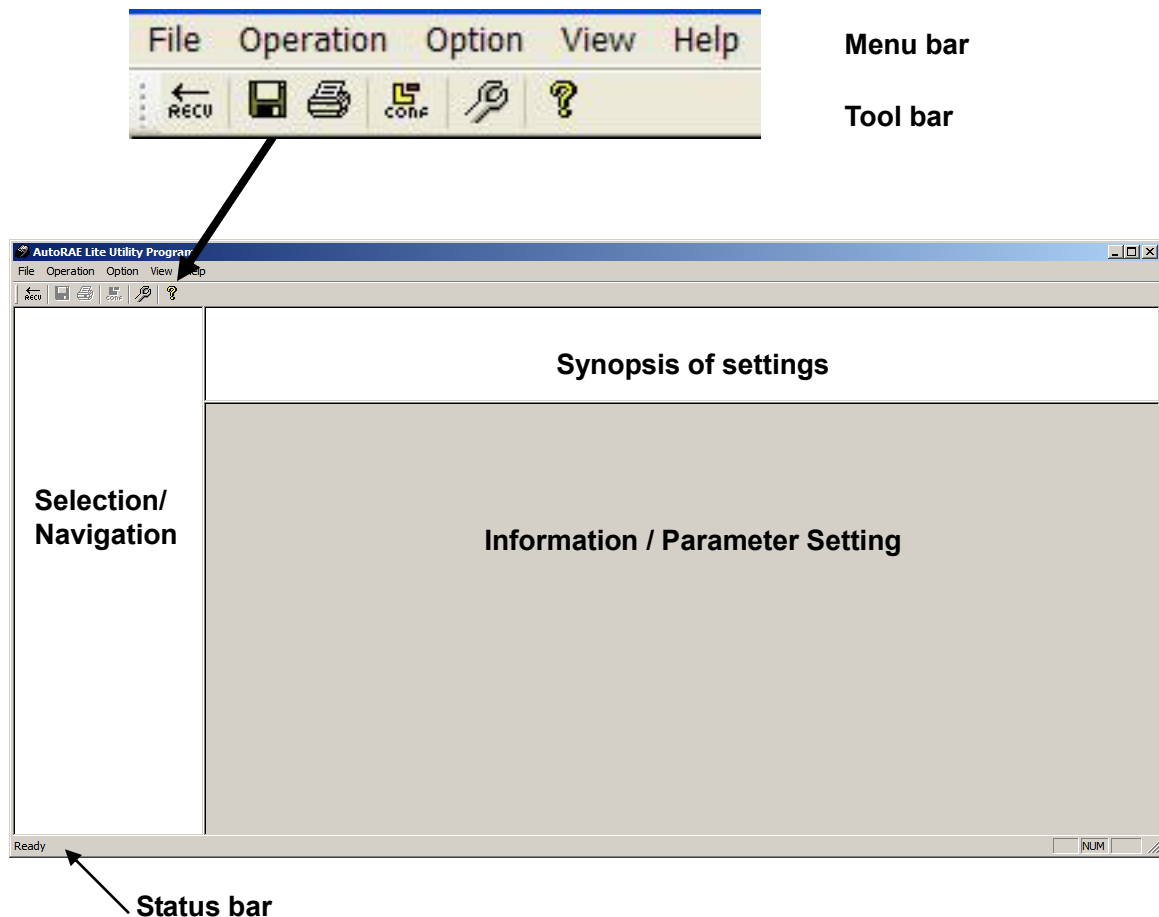
Double-check your COM port choice. Also make sure the USB cable is connected to the AutoRAE Lite, and that the AutoRAE Lite is turned on.

If there are no problems and the port is correctly configured, the COM port dialog box automatically closes.

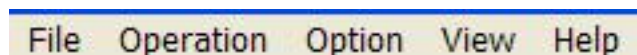
9.3 AutoRAE Lite Utility Program User Interface

The AutoRAE Lite Utility Program can be used to check and configure the AutoRAE Lite or the AutoRAE Lite and a ToxiRAE 3 monitor.

The program's screen consists of a menu bar, toolbar, and a left selection/navigation pane, and two right information panes for synopsis and information. In addition, when the program is in Administrator Mode, the lower right pane becomes an interface for setting parameters in a ToxiRAE 3. At the bottom of the screen is a Status Bar, which tells when the program is ready.



9.3.1 Menu Bar



The **menu bar** consists of five pull-down menus:

- File
- Operation
- Option
- View
- Help

File. The File menu includes:

- | | |
|-----------------|---|
| • Save | Save the current file |
| • Print | Print the synopsis information |
| • Print Preview | View the page to be printed before printing it |
| • Print Setup | Standard choices for setting the page's parameters for printing |
| • Exit | Exit the AutoRAE Lite Utility Program |

Operation. These are functions for communication and controlling the AutoRAE Lite's and ToxiRAE 3's parameters.

- | | |
|------------------------------|---|
| • Setup Port | Set the COM (communication) port |
| • Get Configurations | Open saved configurations in the program window |
| • Operation Mode | Go to User Mode or Administrator Mode |
| • Load Monitor Configuration | Open a ToxiRAE 3 configuration file. |
| • Upgrade Firmware | Upgrade the AutoRAE Lite's firmware |

Option. This provides a submenu that includes language, which allows you to choose a language in which to operate.

- | | |
|------------|------------------------------------|
| • Language | Select a language for the program. |
|------------|------------------------------------|

View. Make the Tool Bar and Status Bar viewable or hidden.

- Toolbar
- Status Bar

Help. This is information to aid in using the AutoRAE Lite.

- | | |
|--------------------------------------|-----------------------------------|
| • About AutoRAE Lite Utility Program | Displays program's version number |
| • Help | Window pops up with assistance. |

9.3.2 Toolbar



The **toolbar** consists of six clickable icons, from left to right:

- RECV (Get Configurations)
- Save The Active Document
- Print The Active Document
- Load Monitor Configuration (Administrator Mode only)
- Upgrade Firmware
- Display Program Information

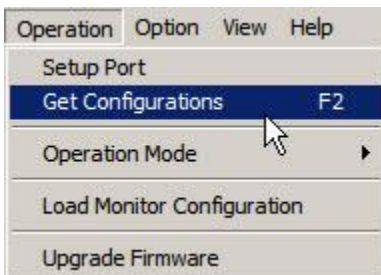
These icons are duplicates of major functions in the menu bar. If the menu bar is turned off, these provide quick, convenient way to activate major functions. Note that the Configuration icon is not functional in User Mode and is therefore grayed out.

9.4 Using The AutoRAE Lite Utility Program In User Mode

The AutoRAE Lite Utility Program operates in two modes, User Mode and Administrator Mode. In both modes, it can be used to check the AutoRAE Lite or the AutoRAE Lite and a ToxiRAE 3 monitor. In Administrator Mode, settings for the AutoRAE Lite and ToxiRAE 3 can be set.

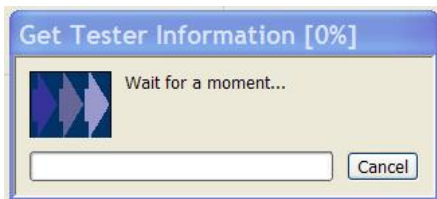
9.4.1 Without A ToxiRAE 3 In The Dock

With the main window open, pull down Operation and select “Get Configurations.”

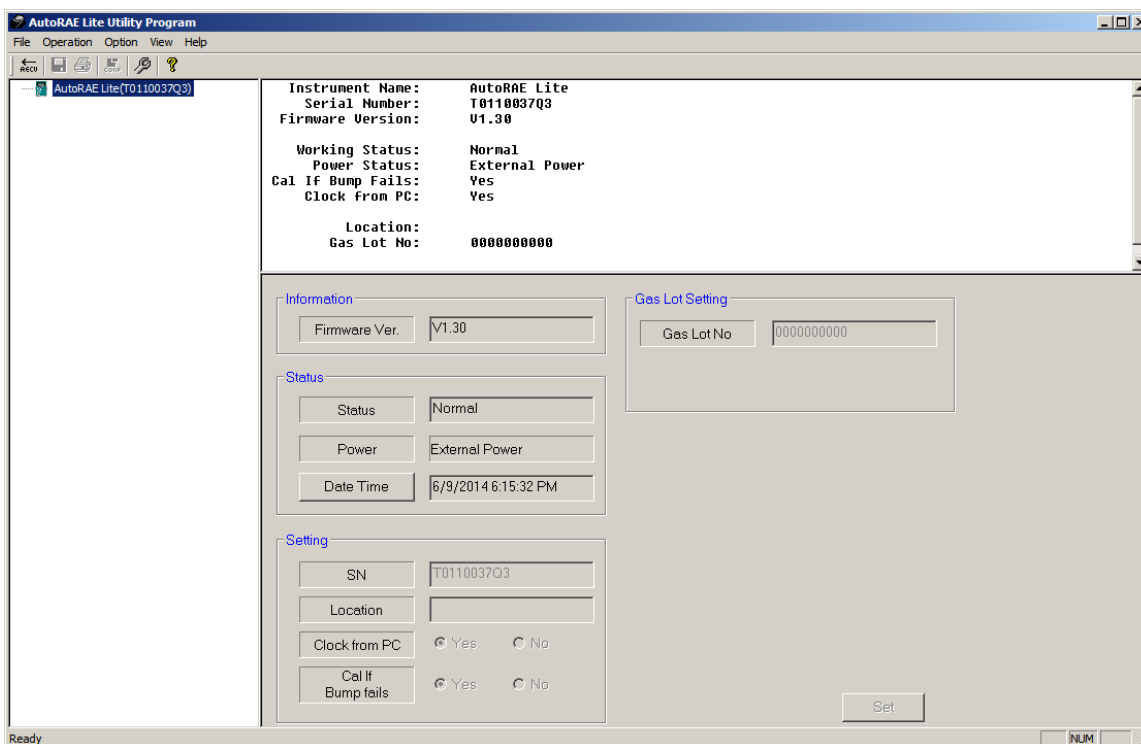


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As the connection is being made and the AutoRAE Lite configuration data is transferred, an animated pop-up window with a progress bar is shown:



Once the information is acquired, the main screen is populated with information:



In the left pane is an icon for the AutoRAE Lite and its serial number. The upper right pane provides a synopsis of information acquired from the AutoRAE Lite, including Instrument Name, Serial Number, and Firmware Version. It also provides functional information, including Working Status and Power Status (battery or external power). Finally, it shows preferences that can be set in Administrator Mode, including Calibrate If Bump Fails, Clock From PC (synchronizes time in the AutoRAE Lite to the computer's time), and Gas Lot Number (in case you want to keep a record of which gas lot the calibration gas comes from).

The bottom portion is grayed out, indicating that the parameters are being read, but cannot be altered in User Mode.

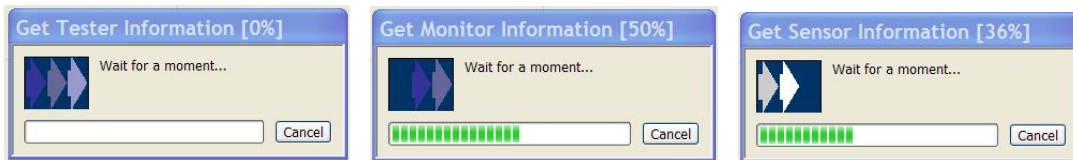
AutoRAE Lite User's Guide

9.4.2 With A ToxiRAE 3 In The Dock

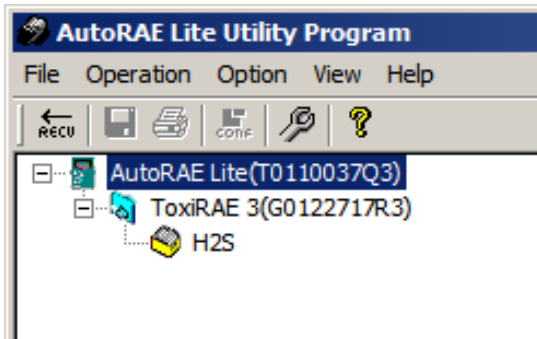
When a ToxiRAE 3 is in the AutoRAE Lite's dock, it is possible to gather data from the ToxiRAE 3 via the AutoRAE Lite Utility Program.

1. Start the AutoRAE Lite Utility Program.
2. Turn on a ToxiRAE 3.
3. Press and hold [Y/+] until you see "Ir."
4. Place the ToxiRAE 3 into the AutoRAE Lite's dock.
5. At the menu bar, pull down "Operation" and select "Get Configurations."

As the connection is being made and the AutoRAE Lite configuration data is transferred, a succession of three animated progress pop-up windows is shown:

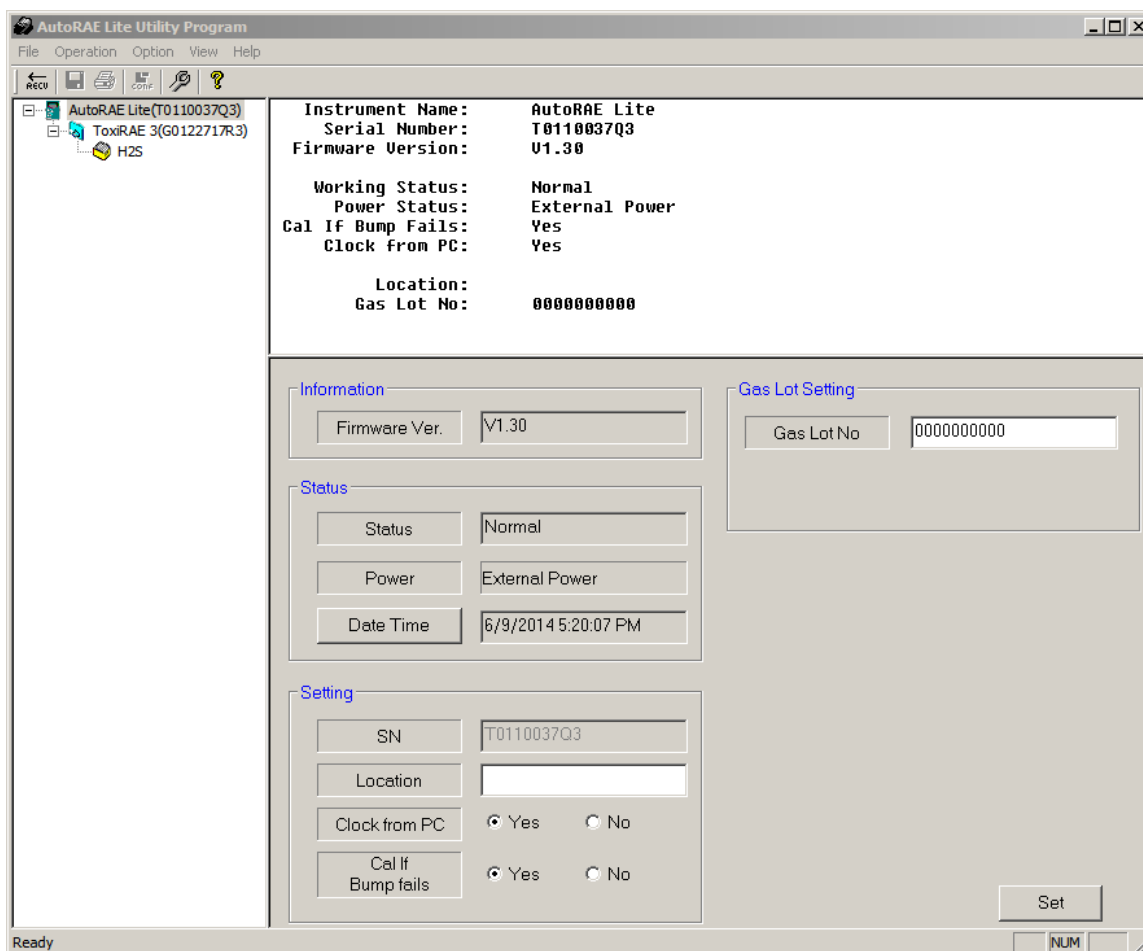


The main screen is populated with data and now includes icons of the ToxiRAE 3 and its sensor in the left pane, along with the ToxiRAE 3's serial number:

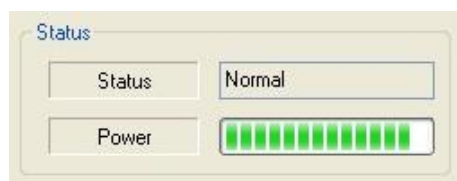


AutoRAE Lite User's Guide

The other panes are populated with data about the AutoRAE Lite:

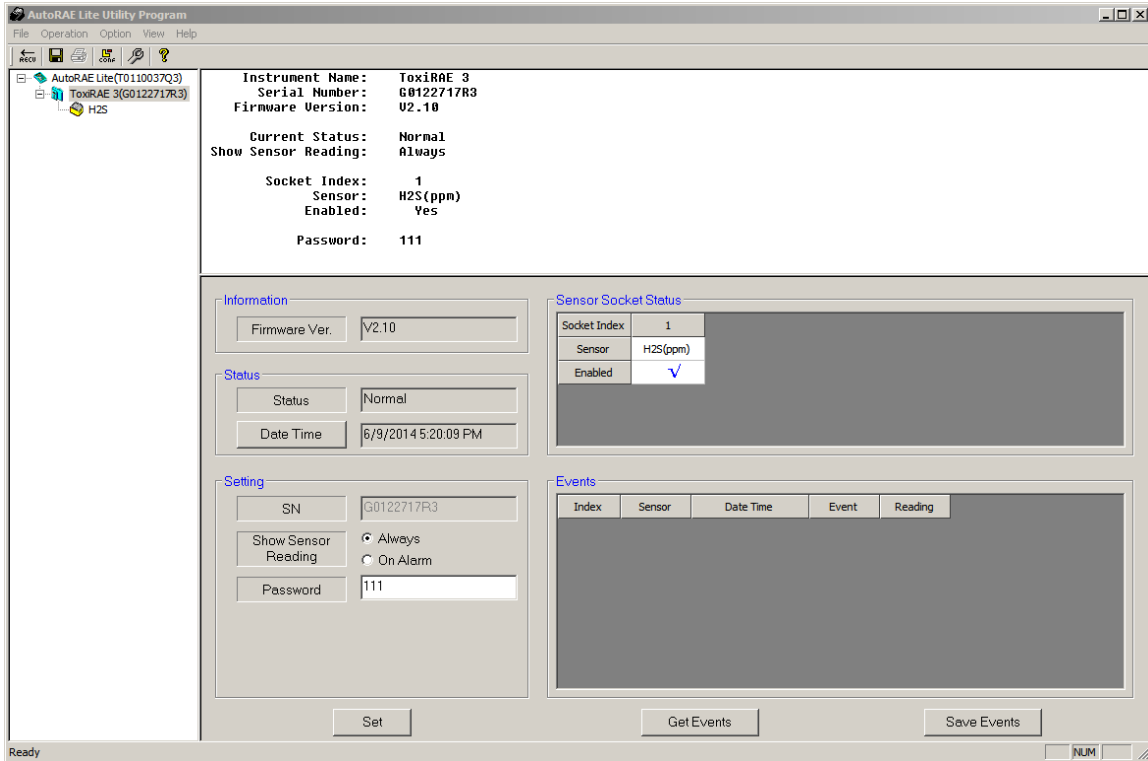


Note: When the AutoRAE Lite is running on its charger with an AC power source, “External Power” is shown in the box next to “Power.” If the AutoRAE Lite is running on its batteries, a battery level bar is shown, which indicates remaining battery life:



AutoRAE Lite User's Guide

Click on the ToxiRAE 3's icon (or text) to change the other two panes' data. The upper right pane provides a synopsis of the data that was transferred from the ToxiRAE 3 to the AutoRAE Lite Utility Program. The lower right pane shows the information in what appears to be an editable format, but is grayed out, indicating that it is "read-only." To change settings in this pane, the AutoRAE Lite Utility Program must be in Administrator Mode.

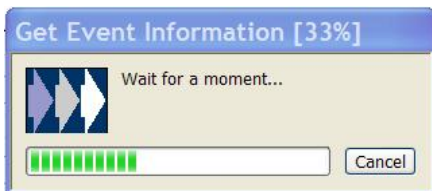


9.4.3 Getting Events Data From A ToxiRAE 3

The lower right pane has a section devoted to events information stored in the ToxiRAE 3. This is "read-only" data, but it can be imported to the computer.

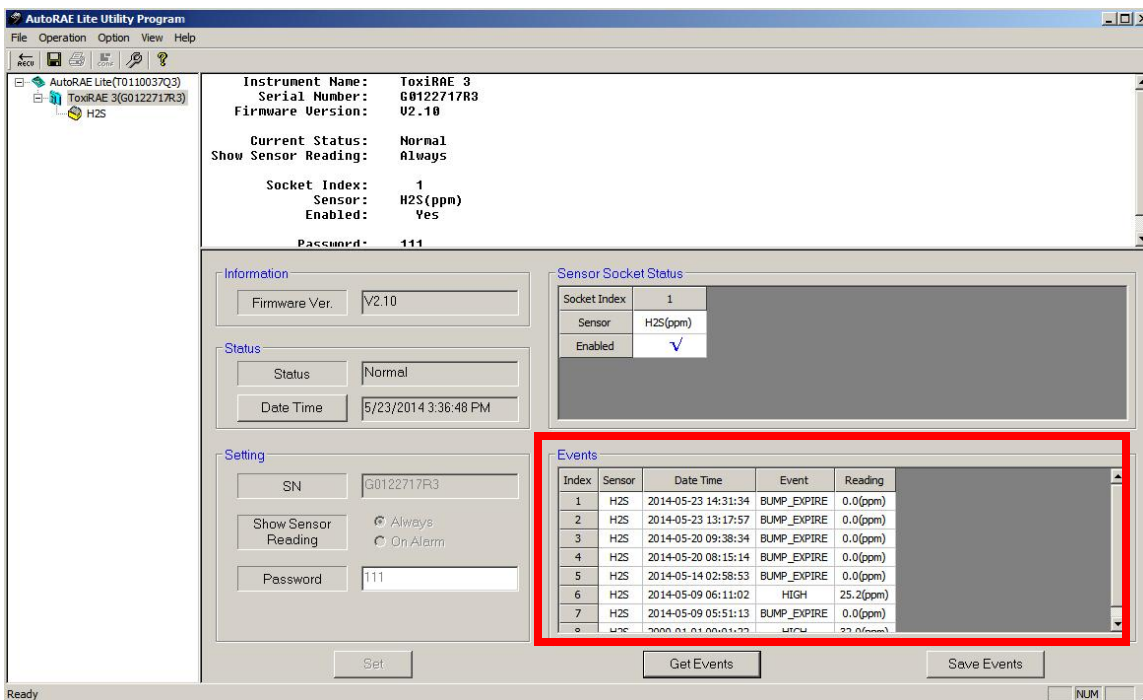
To import the events information, click "Get Events."

As the information is collected, you see this pop-up window:



AutoRAE Lite User's Guide

The information is organized in an index of events, with sensor type, date, time, type of event, and reading.



The number of events indexed depends on the number of alarm events that have taken place in the ToxiRAE 3. Therefore the list can range from 0 (no events) to 10 events.

Click on the sensor's icon (or name) in the left pane to change the other two panes' data. The upper right pane provides a synopsis of the data about the sensor that was transferred from the ToxiRAE 3 to the AutoRAE Lite Utility Program. Included are the last calibration date and the date when calibration is due.

9.4.4 Saving Events From A ToxiRAE 3

Once the events are viewable in the bottom right pane, you can save them in Microsoft Excel spreadsheet (.xls) format. Click "Save Events" and then find a location to put your file. Name it, and click "Save." The file can be opened in Excel and edited or exported from there into other formats.

AutoRAE Lite User's Guide

It also shows the alarm level settings and the calibration span concentration. The lower right pane shows the information in an editable format, but is grayed out, indicating that it is “read-only.” To change settings in this pane, the AutoRAE Lite Utility Program must be in Administrator Mode.

The screenshot displays the AutoRAE Lite Utility Program window. The interface includes a menu bar (File, Operation, Option, View, Help) and a toolbar with icons for back, forward, print, copy, paste, and help. A tree view on the left shows the device hierarchy: AutoRAE Lite(T0110037Q3) > ToxiRAE 3(G0122717R3) > H2S. The main display area shows the following information:

Sensor Name:	H2S
Calibration Date:	5/20/2014 10:30:00 AM
Cal Due Date:	11/19/2014
Cal Interval:	180 days
Bump Date:	6/9/2014 11:39:00 AM
Bump Interval:	0 days
Alarm Levels:	
High:	15.0 ppm
Low:	10.0 ppm
STEL:	15.0 ppm
TWA:	10.0 ppm
Calibration Span:	25.0 ppm

Below this information are four editable panels, all of which are grayed out:

- Calibration Information:** Contains fields for Cal Date (5/20/2014 10:30:00 AM), Cal Due Date (11/19/2014), and Cal Interval (180 days).
- Alarm Levels:** Contains fields for High (15.0 ppm), Low (10.0 ppm), STEL (15.0 ppm), and TWA (10.0 ppm).
- Bump Information:** Contains fields for Bump Date (6/9/2014 11:39:00 AM) and Bump Interval (0 days).
- Calibration Parameters:** Contains a field for Cal Span (25.0 ppm).

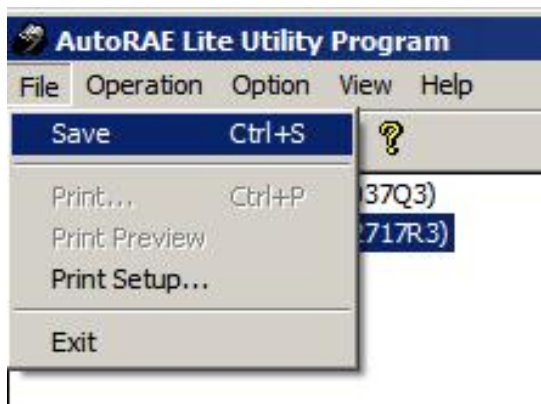
A "Set" button is located at the bottom right of the editable panels. The status bar at the bottom left shows "Ready" and the bottom right shows "NUM".

9.5 Saving Configuration Files

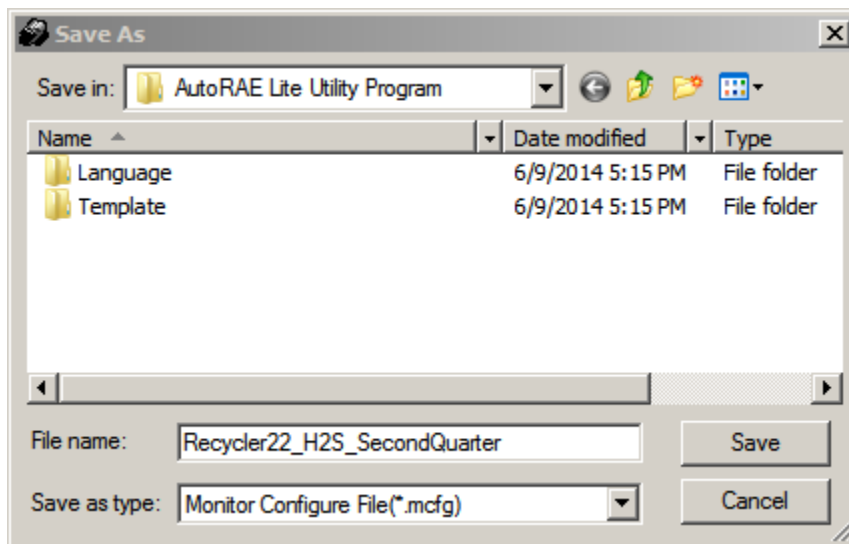
You can save a configuration file for the AutoRAE Lite and for the ToxiRAE3, which includes all current settings as shown in the right data panes.

9.5.1 Saving A ToxiRAE 3 Configuration

1. Click on the ToxiRAE 3 icon in the left pane.
2. Pull down the File menu and click “Save.”



3. When the “Save As” dialog box appears, find a location where you want to save the Monitor Configuration File.
4. Name the file (it automatically gets a “.mcfg” suffix).



5. Click “Save.” The file is saved and the dialog box closes.

Note: Although you can store a configuration file, you cannot load a configuration file unless the AutoRAE Lite Utility is set for Administrator Mode.

9.6 Using The AutoRAE Lite Utility Program In Administrator Mode

Administrator Mode allows you to load configurations from configuration files into the AutoRAE Lite and ToxiRAE 3 monitors. It also allows you to change settings and synchronize an AutoRAE Lite's time to a computer.

9.6.1 Entering Administrator Mode

After you start the AutoRAE Lite Utility Program, you must enter a password to place the program in Administrator Mode.



When the pop-up window appears, you must type in a password:



Note: The default password is **rae**.

Click "OK" to register your password and enter Administrator Mode.

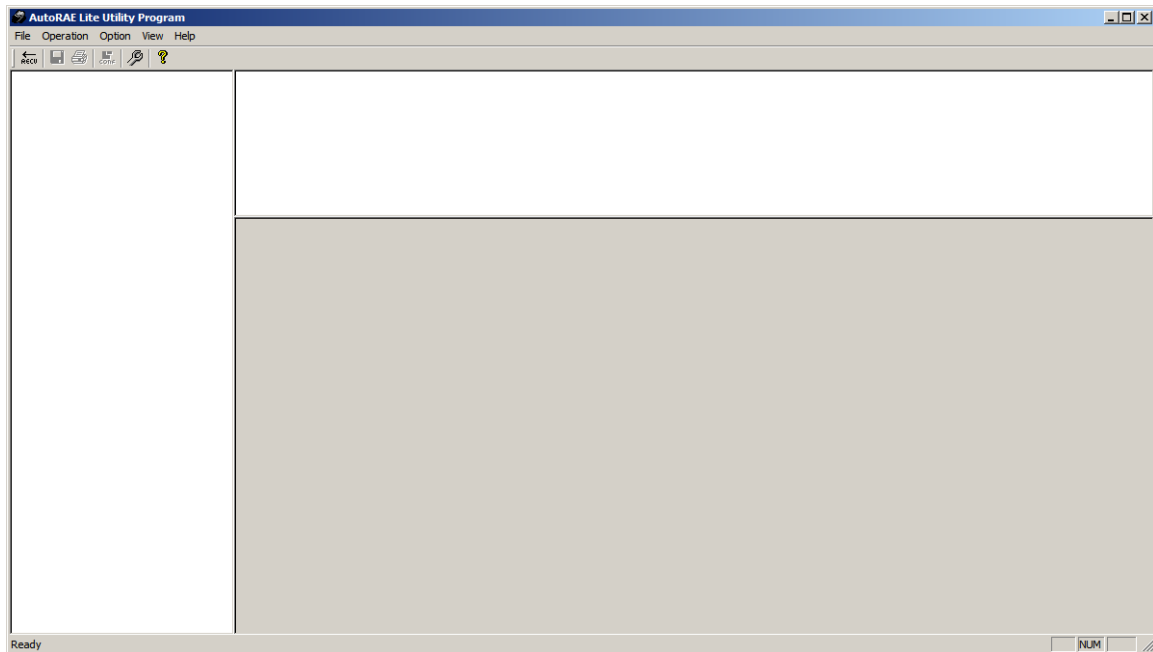
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Note: You can change the password by clicking “Change Password.” A dialog box prompts you to type in the current password and a new password (twice, to make sure that there is no mistake).

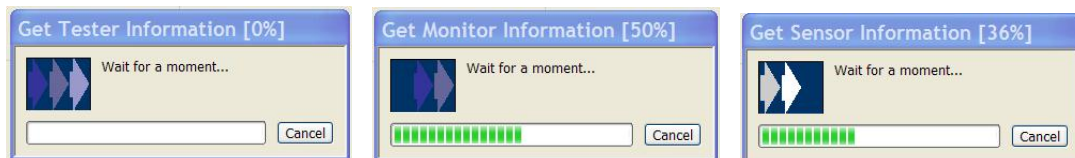


After you are satisfied with the password, click OK to save it.

Once your password is accepted, the pop-up dialog box disappears and the main screen is shown.



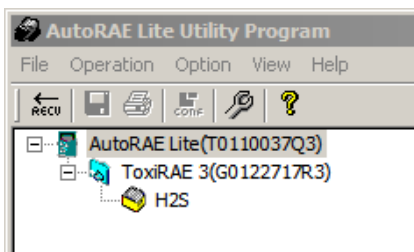
Click “Get Configurations.” As the connection is being made and the AutoRAE Lite configuration data is transferred, a succession of three animated progress pop-up windows is shown:



The main screen is populated with data and now includes icons of the AutoRAE Lite, the ToxiRAE 3, and its sensor in the left pane, along with the AutoRAE Lite's and ToxiRAE 3's serial numbers.

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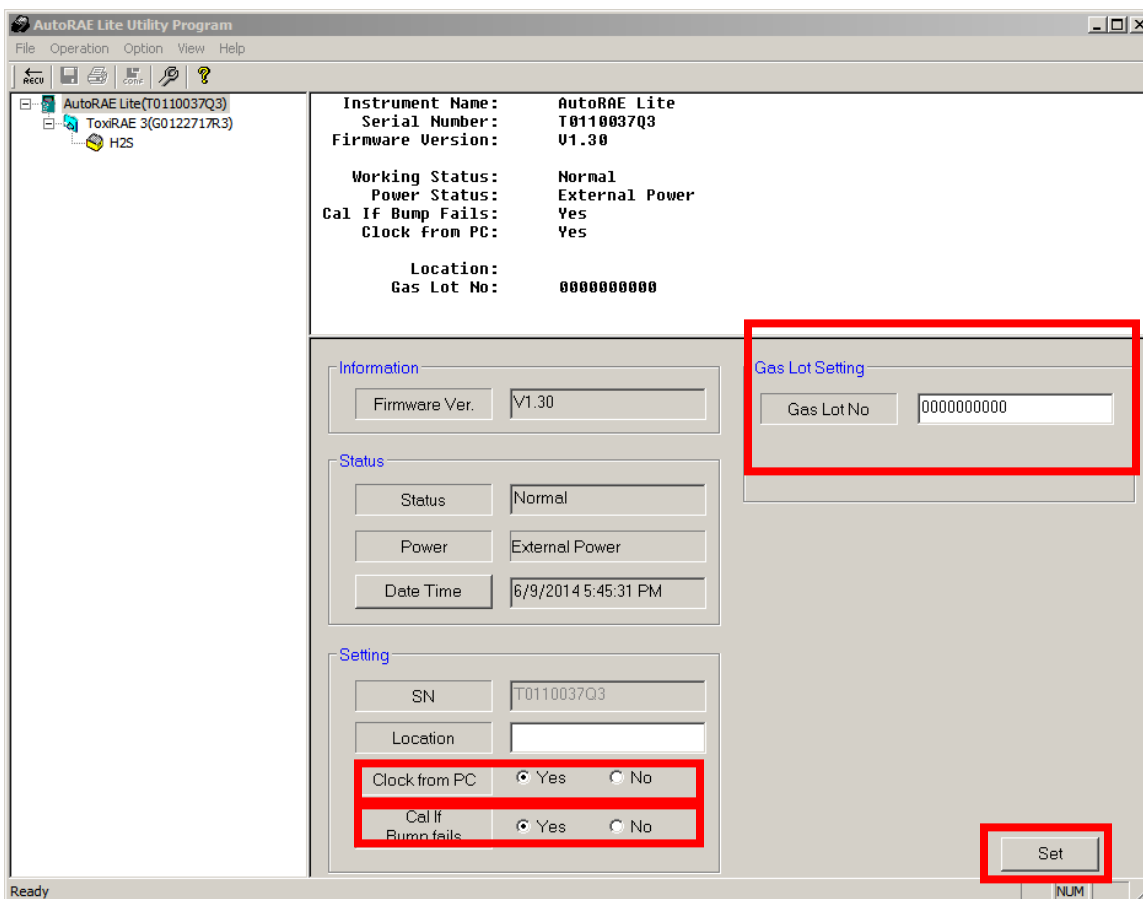
9.6.2 AutoRAE Lite Screen



The other panes are populated with data about the AutoRAE Lite. Unlike User Mode, Administrator Mode now shows the lower right pane in an editable form. You can now edit:

- **Gas Lot No** Gas Lot number, as shown on the side of a gas cylinder
- **Clock From PC** Synchronize the clock in the AutoRAE Lite to the PC's time
- **Cal If Bump Fails** Tell AutoRAE Lite to perform a calibration if a bump test fails

In addition, you can click “Set” to set these parameter changes in the AutoRAE Lite.



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9.6.3 ToxiRAE 3 Screen

Click on the ToxiRAE 3 icon or text in the left pane, and the lower right pane now shows its editable functions that affect a ToxiRAE 3 in the AutoRAE Lite's dock. These include:

- **Show Sensor Reading** Tells the ToxiRAE to show the sensor reading always or only when an alarm sounds
- **Password** Changes the password in the ToxiRAE 3

When you click “Set,” the parameter changes are set in any ToxiRAE 3 that is in the AutoRAE Lite's dock.

Important! If you do make parameter changes on the screen, but do not click “Set,” the changes are not transferred to the ToxiRAE 3. Changes are only transmitted and registered by clicking “Set.”

AutoRAE Lite Utility Program

File Operation Option View Help

← RECU COPY ?

Instrument Name: ToxiRAE 3
Serial Number: G0122717R3
Firmware Version: V2.10

Current Status: Normal
Show Sensor Reading: Always

Socket Index: 1
Sensor: H2S(ppm)
Enabled: Yes

Information

Firmware Ver. V2.10

Status

Status Normal

Date Time 6/9/2014 5:45:39 PM

Setting

SN G0122717R3

Show Sensor Reading ☒ Always ☐ On Alarm

Password 111

Sensor Socket Status

Socket Index	1
Sensor	H2S(ppm)
Enabled	<input checked="" type="checkbox"/>

Events

Index	Sensor	Date Time	Event	Reading
-------	--------	-----------	-------	---------

Set Get Events Save Events

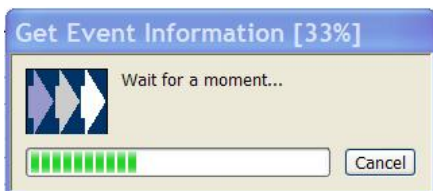
Ready NUM

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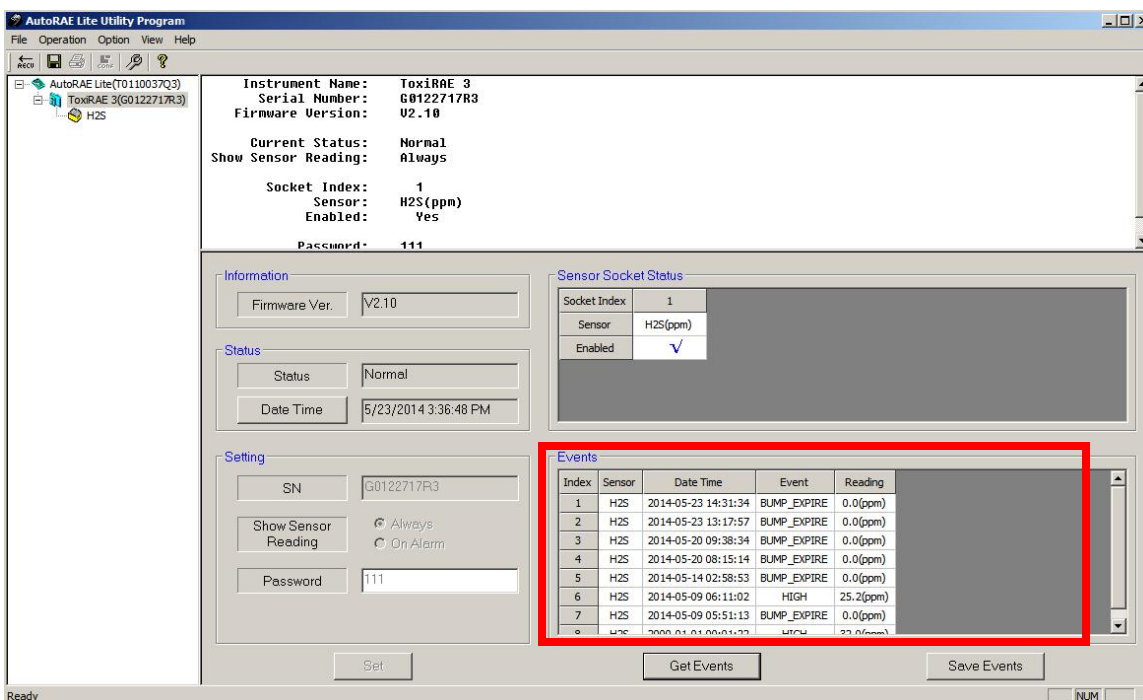
9.6.3.1 Getting Events Data From A ToxiRAE 3

The lower right pane has a section devoted to events information, which is stored in the ToxiRAE 3. This is “read-only” data, but can be imported. To import the events information, click “Events.”

As the information is collected, you see this pop-up window:



The information is organized in an index of events, with sensor type, date, time, type of event, and reading.



The number of events indexed depends on the number of alarm events that have taken place in the ToxiRAE 3. Therefore the list can range from 0 (no events) to 10 events.

9.6.3.2 Saving Events Data From A ToxiRAE 3

Once the events are visible in the bottom right pane, you can save them in an Excel spreadsheet (.xls) format. Click “Save Events” and then find a location to put your file. Name it, and click “Save.” The file can be opened in Excel, and edited or exported to other formats from there.

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9.6.4 ToxiRAE 3 Sensor Screen

Click on the sensor icon (for example, H2S) or its text in the left pane, and the lower right pane now shows its editable functions that affect a ToxiRAE 3 in the AutoRAE Lite's dock. These include:

- **Calibration Dates & Interval** Shows the calibration date and due date and sets the number of days (interval) until the monitor requires calibration
- **Bump Date & Interval** Shows the bump date and sets the bump interval.
- **Alarm Levels** Sets the threshold concentrations at which the High, Low, STEL, and TWA alarms sound (refer to the ToxiRAE 3 User's Guide for further explanation)
- **Calibration Span** Concentration of gas used for calibration

Click "Set" to store the parameter changes in any ToxiRAE 3 that is in the AutoRAE Lite's dock.

Important! If you do make parameter changes on the screen, but do not click "Set," the changes are not transferred to the ToxiRAE 3.

The screenshot displays the 'AutoRAE Lite Utility Program' window. On the left, a tree view shows 'AutoRAE Lite(T0110037Q3)' and 'ToxiRAE 3(G0122717R3)' with an 'H2S' sensor icon selected. The main area shows sensor details for H2S:

Sensor Name:	H2S
Calibration Date:	5/20/2014 10:30:00 AM
Cal Due Date:	11/19/2014
Cal Interval:	180 days
Bump Date:	6/9/2014 11:39:00 AM
Bump Interval:	0 days
Alarm Levels:	
High:	15.0 ppm
Low:	10.0 ppm
STEL:	15.0 ppm
TWA:	10.0 ppm
Calibration Span:	25.0 ppm

Below this, there are four sections for editing parameters:

- Calibration Information:** Includes fields for Cal Date (5/20/2014 10:30:00 AM), Cal Due Date (11/19/2014), and Cal Interval (180 days).
- Bump Information:** Includes fields for Bump Date (6/9/2014 11:39:00 AM) and Bump Interval (0 days).
- Alarm Levels:** Includes fields for High (15.0 ppm), Low (10.0 ppm), STEL (15.0 ppm), and TWA (10.0 ppm).
- Calibration Parameters:** Includes a field for Cal Span (25.0 ppm).

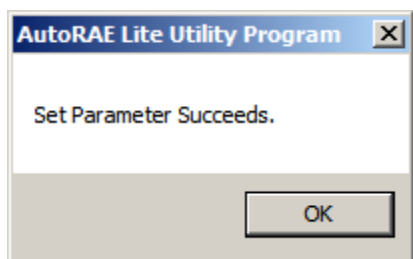
A 'Set' button is located at the bottom right of the parameter sections. The status bar at the bottom shows 'Ready' and a 'NUM' indicator.

9.6.5 Configuring Multiple ToxiRAE 3 Monitors

With the AutoRAE Lite Utility Program in Administrator Mode, you can set new parameters in as many ToxiRAE 3 monitors as you want, allowing uniform configuration of many ToxiRAE 3 monitors.

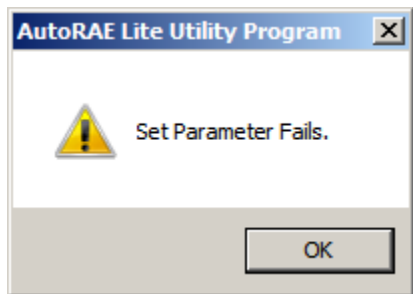
1. Place a ToxiRAE 3 in the dock.
2. Click "Set." Parameters are transferred to the ToxiRAE 3 automatically.
3. Remove the ToxiRAE 3.
4. Place another ToxiRAE 3 in the dock.
5. Press "Set."

If the parameters are successfully transferred, you see this dialog box:



6. Repeat this process as many times as you want.

Note: If there is an error in the data transfer to any ToxiRAE 3, you see this message:



Check the parameter settings and cable connections, and try again.

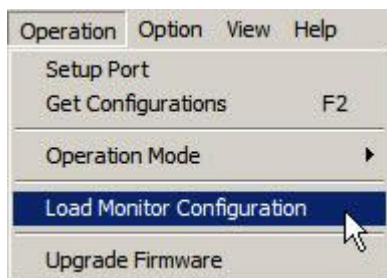
Important! If the problem persists, refer the ToxiRAE 3 to qualified service personnel. Do not place it into service.

9.7 Using Saved Configuration Files

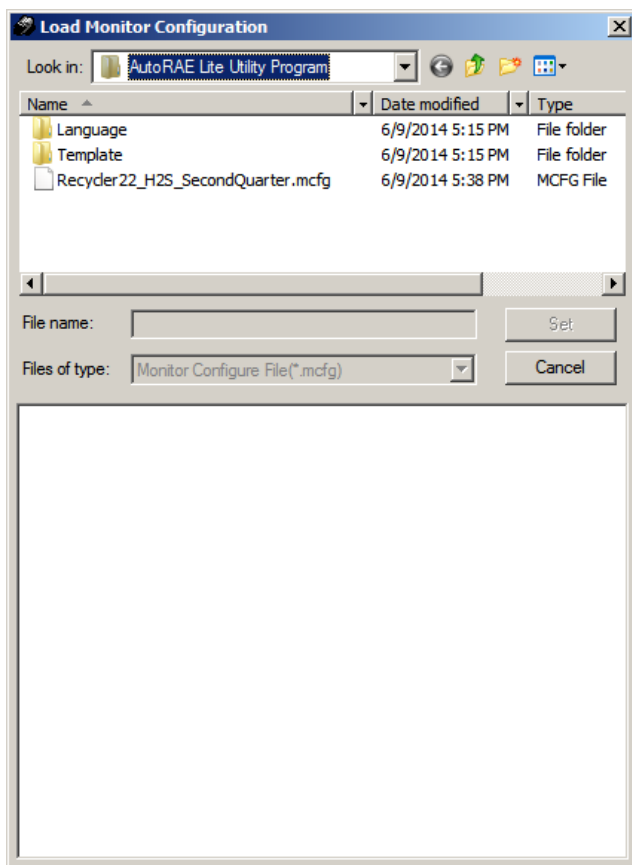
Because the AutoRAE Lite Utility allows you to save monitor configurations, you can load a monitor configuration from your computer for upload to a ToxiRAE 3. This is especially useful when you want many ToxiRAE 3 monitors to use a single configuration.

Note: You can only load a configuration file if the AutoRAE Lite Utility is in Administrator Mode. Once you have provided a password and have entered Administrator Mode, you can load a previously saved monitor configuration.

1. Under Operation, select “Load Monitor Configuration.”

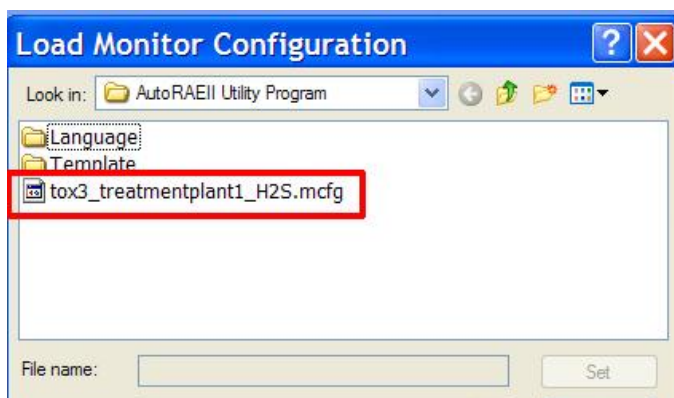


2. A pop-up window labeled “Load Monitor Configuration” appears. Locate a configuration file that you have saved previously. It has a “.mcfg” suffix, as in “toxi3_treatmentplant1_H2S.mcfg.”

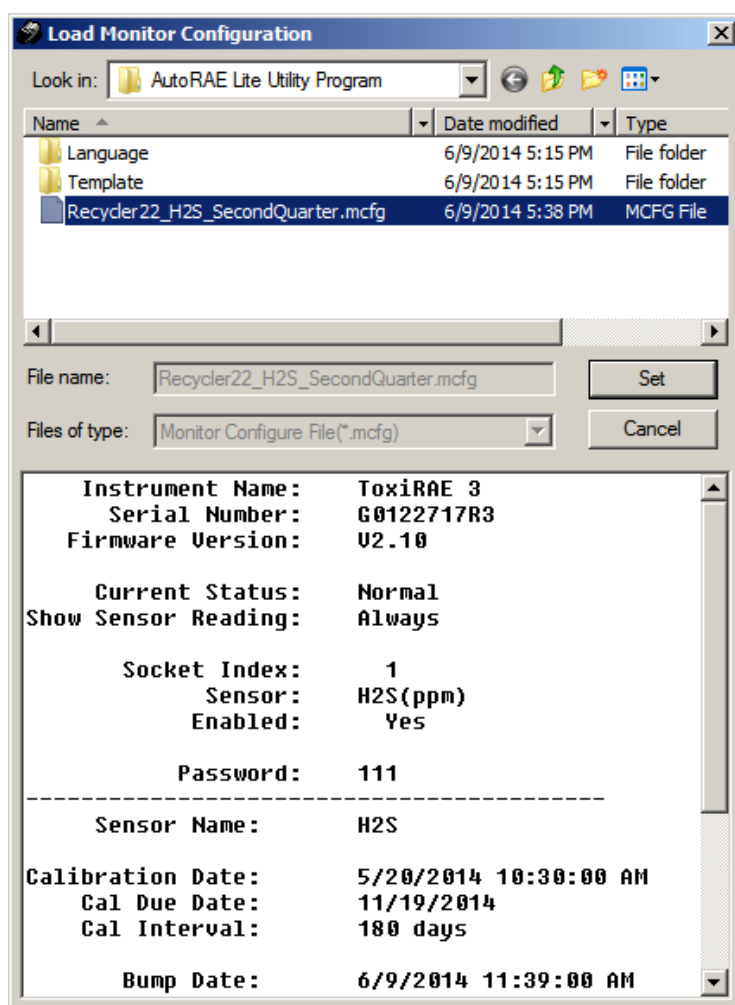


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- Click on the name of the configuration file to select it.



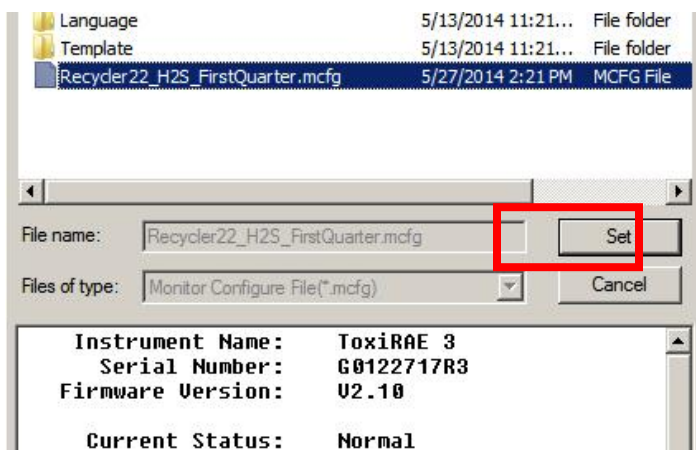
- The information saved in the configuration file is now shown in the lower pane of the pop-up window, so that you can ensure that you have the correct configuration file and that its parameters are the ones you want to load into the AutoRAE Lite Utility (and eventually into your monitors).



Important! Always double-check the configuration settings to ensure they are correct. If they are not correct, or if due dates have passed, use another configuration file or create a new one.

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- Click “Set” to load the configuration into the AutoRAE Lite Utility.



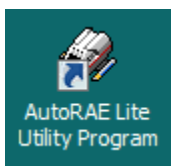
10 Updating The AutoRAE Lite Firmware

New firmware updates occasionally become available for the AutoRAE Lite. Once the firmware update is downloaded from the RAE Systems website or from a disc to your computer, follow these steps:

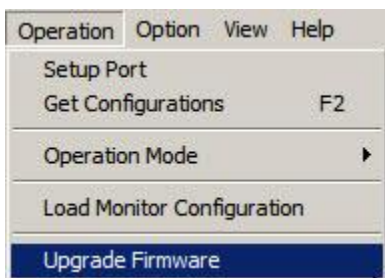
- Connect the AutoRAE Lite to the computer using a USB cable.
- Power up the AutoRAE Lite (make sure it has batteries in it or has its AC adapter connected and plugged in).

Note: Make sure a ToxiRAE 3 is not in the dock.

- Start the AutoRAE Lite Utility Program by double-clicking its icon on the computer's desktop.

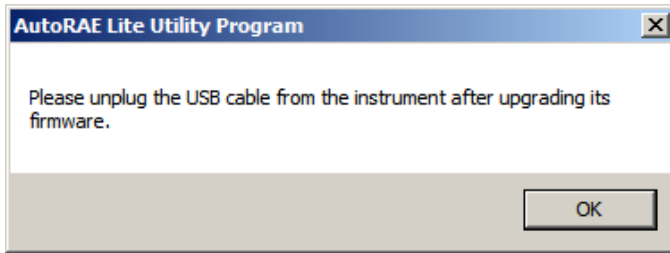


- When the main program window is shown, pull down the Operation menu and select “Upgrade Firmware.”

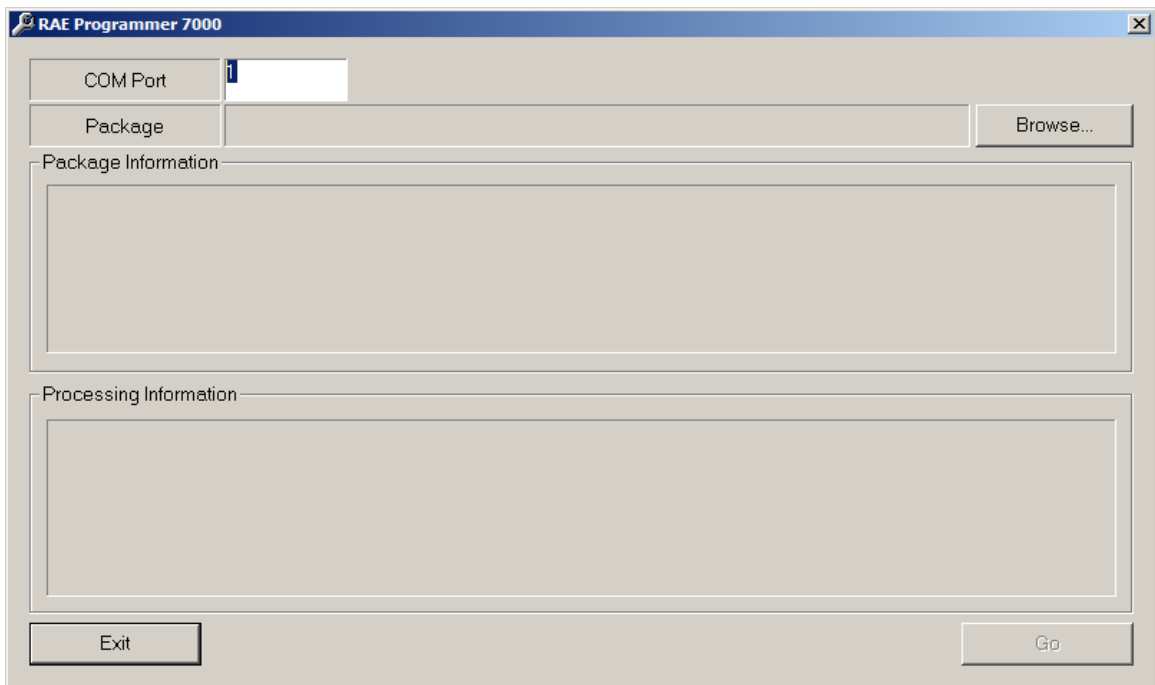


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5. A pop-up window appears, reminding you to unplug the USB cable when you are done updating the firmware. Click “OK.”

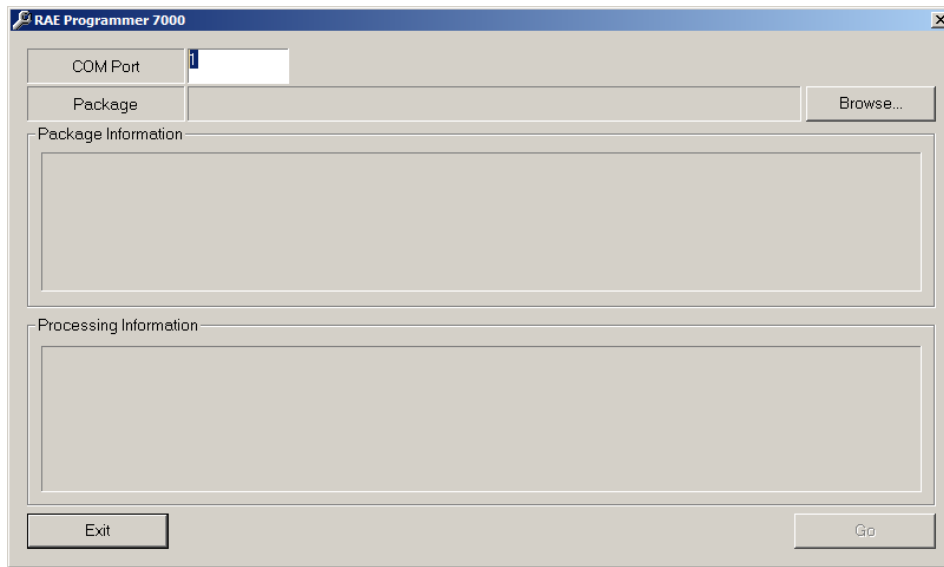


6. The RAE Programmer 7000 dialog box appears. Set the COM port to match your current configuration (for example, “6”).

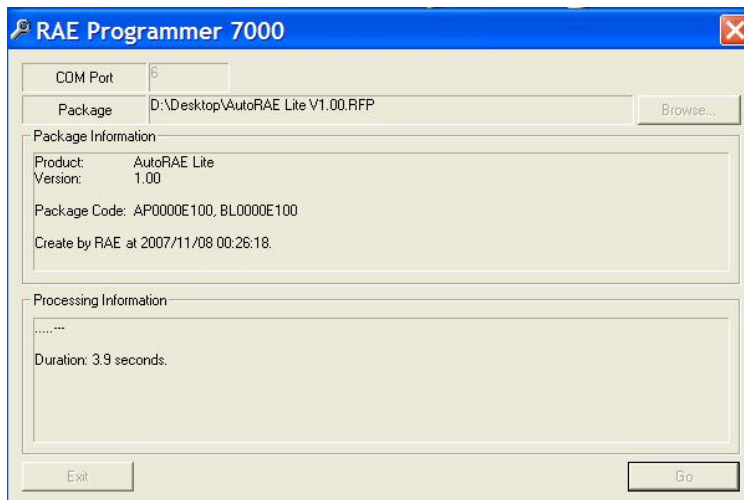


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- Click “Browse...”

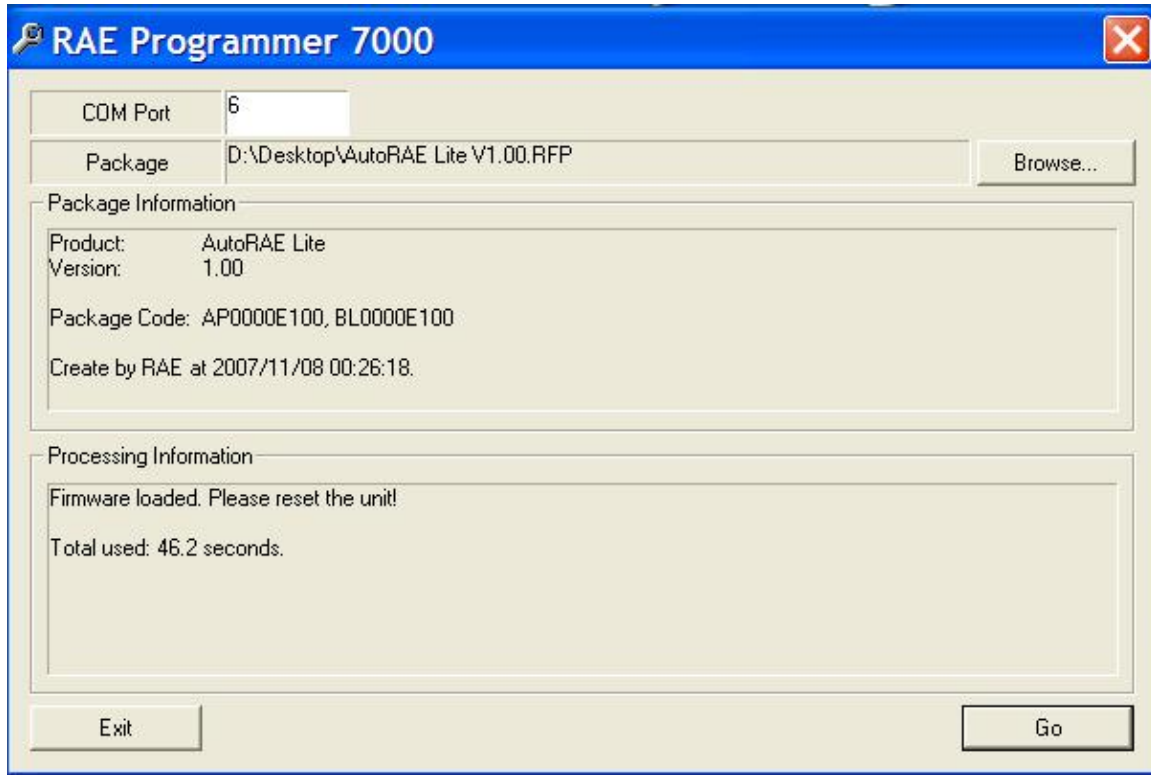


- Locate the firmware update file on your computer (it has a “.rfp” suffix).
- Once you select the file, click “Open.” RAE Programmer 7000 opens.
- Click “Go” to start updating the firmware. You receive the message “Processing Information” as the updating progresses.



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11. When the firmware update is complete, you receive the message "Firmware loaded. Please reset the unit!" Click "Exit."



12. Unplug the USB cable, and exit the AutoRAE Lite Utility Program.

11 Formatting An SD Card

If you purchase an SD card for use in an AutoRAE Lite, it may need to be formatted before it is used. RAE Systems SDHC cards come pre-formatted (RAE Systems part number 550-0301-000).

IMPORTANT!

It is a good idea to transfer the data from an SD card at regular intervals. Larger amounts of data result in longer times for transferring data.

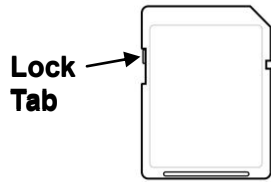
11.1 Checking Whether An SD Card Needs Formatting

If the AutoRAE Lite's Service Requested LED blinks orange or if you are using a new SD card for the first time, the SD card may need to be formatted. The AutoRAE Lite does not automatically format a card, because there may be valuable data on the card. Therefore, you must remove the SD card from the AutoRAE Lite and connect it to a computer so that you can check it, and if necessary, format it.

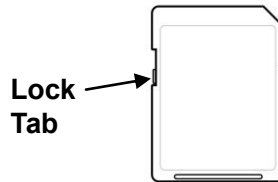
SD cards typically come pre-formatted by the manufacturer, but for an SD card to operate properly in the AutoRAE Lite, it must be formatted for FAT32, a 32-bit file allocation system. If the card is formatted for FAT or FAT16 or unformatted, it must be formatted for FAT32.

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Before using an SD card or checking whether it needs formatting, make sure that its lock tab is in the “unlocked” position.



Unlocked SD Card



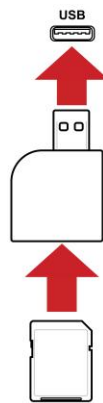
Locked SD Card

11.2 Formatting An SD Card

WARNING!

Formatting an SD card erases everything on the card. Once an SD card is formatted, any contents that were on it cannot be recovered. Always make a backup of the data on an SD card before reformatting it.

1. Make sure the SD card is not locked.
2. Place the SD card into an adapter and connect it to a computer's USB port.



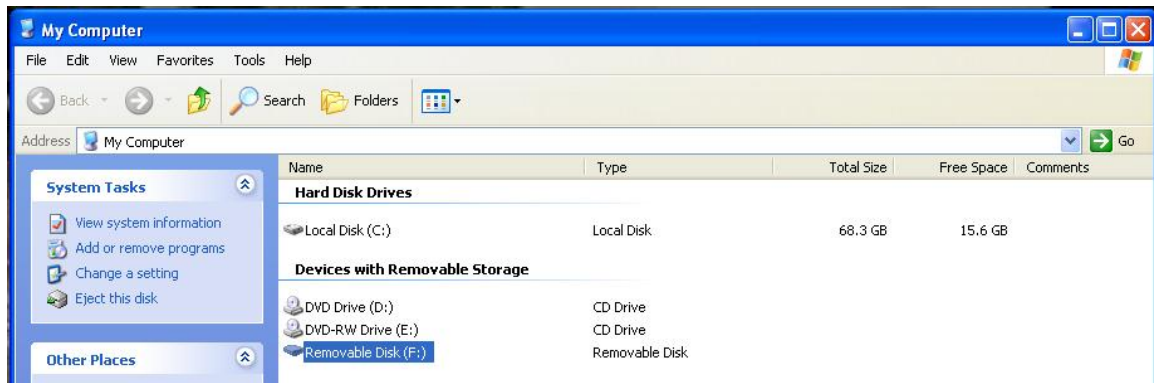
Place the SD card into an adapter and plug it into the USB port of a computer.

3. Double-click the “Computer” icon on the computer's desktop.

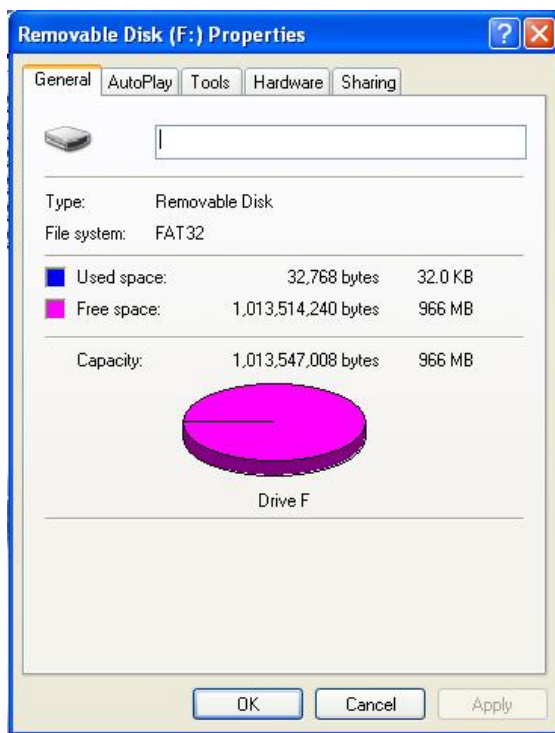


4. The list of Devices with Removable Storage should include your SD card with a title of “Removable Disk” or a name that indicates the SD card.

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5. Right-click on the Removable Disk item to get details about it:

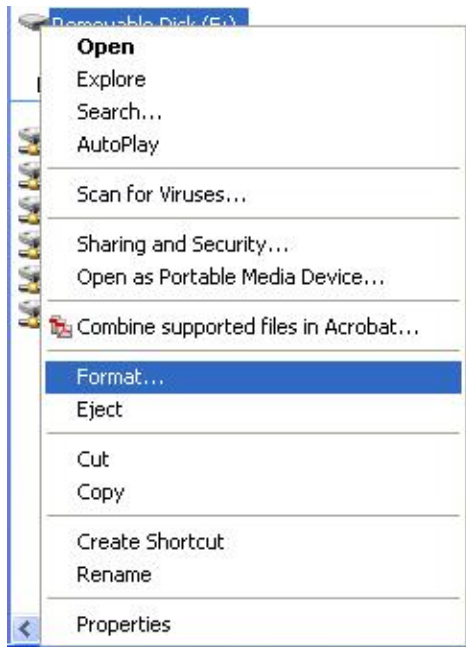


6. If the file system says “FAT 32,” then you can click OK and use (or continue to use) the disk. If the disk is formatted for any other file system (FAT or FAT 16, for example), you should reformat it for FAT 32.

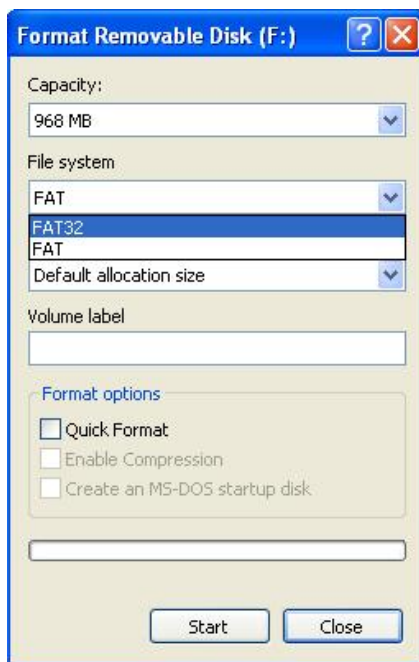
Note: If the disk is formatted for FAT 32 and you simply want to reformat the disk, follow the steps outlined below, as if it were a new disk or one that is formatted for another file system.

7. Click OK to close the dialog box.
8. Right-click on “Format...”

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9. Under “File System,” select “FAT 32.”



10. Click “Start.” (It does not matter whether you select “Quick Format,” so leave it unchecked.)
11. A pop-up window warns you that everything on the disk will be erased during formatting. If you do not want to continue with the formatting operation, click “Cancel.” Otherwise, click “OK.”

AutoRAE Lite User's Guide



12. Formatting should take less than one minute. When the operation is complete, you see this message:



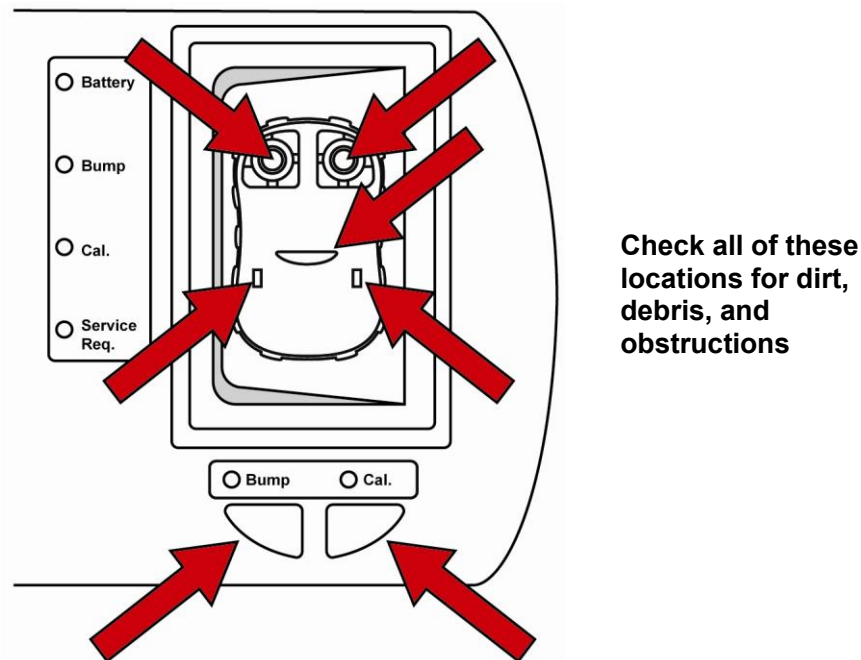
13. Click "OK." The SD card can now be used in the AutoRAE Lite. Remove it and place it in the AutoRAE Lite.

12 Maintenance

Occasional cleaning of the AutoRAE Lite's exterior is recommended. Use a damp cloth (water only, no solvents or cleaners) to wipe the exterior case and the dock area.

Inspect the ports in the dock and the space between the Bump and Cal. buttons and the case. All of these locations are indicated below. If dirt has settled into any of these places, use a can of compressed air to blow it out.

Important! Never use sharp tools or solvents to dislodge small obstructions. If debris is lodged in any portion of the AutoRAE Lite and cannot be removed by compressed air or soft cloth, refer it to qualified service personnel.



Inspect the AC adapter's wires, the SD card slot, the USB port, the LEDs, and the area around the Bump and Calibration buttons for dirt or debris. Also check the two rectangular switch locations and the infrared communication port in the middle of the dock for dirt or debris.

Do not leave dead batteries in the AutoRAE Lite. Over time, they may leak or corrode, causing damage to the components in the battery compartment. Always use high-quality alkaline batteries.

13 Troubleshooting

Problem	Possible Reasons & Solutions
Cannot perform Bump or Calibration. Bump and Cal. LEDs are dark and Service Req. LED glows red.	<p>Reasons: ToxiRAE 3 is not in "Ir" mode. SD card is not installed. SD card has little or no space remaining. SD card is damaged. SD card is locked (LED blinks orange instead of red).</p> <p>Solutions: Place ToxiRAE 3 in "Ir" mode and press [Y/+]. Install SD card. Clear space on SD card (using computer) or use new SD card. Replace with SD card known to be undamaged. Unlock SD card by moving locking tab.</p>
All LEDs dark. AutoRAE Lite is not receiving power.	<p>Reasons: Loose/damaged wire in cable from AC adapter to AutoRAE Lite. Damaged/defective AC adapter. Power source to AC adapter turned off/disconnected. Dead batteries.</p> <p>Solutions: Check AC adapter wire and connection to AutoRAE lite. Replace AC adapter. Check that AC power source is connected and turned on. Replace batteries.</p>
Cannot perform Bump or Calibration, but LEDs are glowing normally (green).	<p>Reasons: Empty calibration gas tank. Obstruction between ToxiRAE 3 and dock. Defective gauge or obstruction in inlet line.</p> <p>Solutions: Check that calibration tank has sufficient gas (it should register >50psi). Remove ToxiRAE 3 and check that it is clean and that the dock area is also clean. Try a calibration tank known to be full. If gauge does not register, gauge may be defective or there may be an obstruction in the inlet line. Check the filter and line for obstructions and clear them.</p>
Pump does not operate	<p>Reasons: Pump is damaged, obstructed, or disconnected.</p> <p>Solutions: Check pump wiring, clear obstructions, or replace pump.</p>
Time/date are wrong in Events log or datalog from SD card	<p>Reasons: Time needs to be synchronized on AutoRAE Lite and on ToxiRAE 3.</p> <p>Solutions: Connect AutoRAE Lite to computer and use AutoRAE Lite Utility program to reset AutoRAE Lite's internal clock. If ToxiRAE 3 has wrong time/date, place ToxiRAE 3 in AutoRAE Lite dock and reset time/date.</p>
Bump testing and calibration take more time than usual	<p>Reasons: There may be too much data stored on the SD card, or the SD card may need reformatting.</p> <p>Solutions: Transfer the data from the SD card and then erase or reformat it.</p>
During data transfer process, green LED does not blink but both red and green LEDs blink	<p>Reasons: There may be too much data stored on SD card.</p> <p>Solutions: Transfer the data from SD card and then erase or reformat it.</p>

14 Support

To contact the RAE Systems Technical Support Team:

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