Lumex Mini Mercury Analyzer Instructions and Troubleshooting

Please:

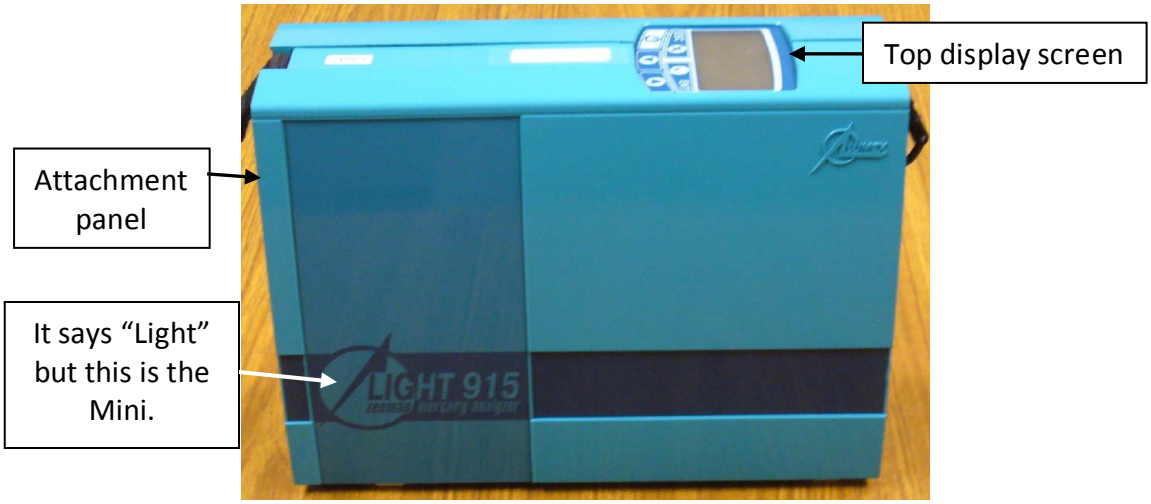
- Do not contaminate the cloth case of the machine with mercury. Do not rest the case on an untested or a contaminated surface.
- Avoid sticking the end of the hose or sampling wand into direct contact with dust, dirt, or mercury.
- Do not change the parameters (settings) on the analyzer.
- Read the troubleshooting section at the end of the instructions if you encounter problems.

Differences between the Regular and Lite Lumexes vs. the Mini:

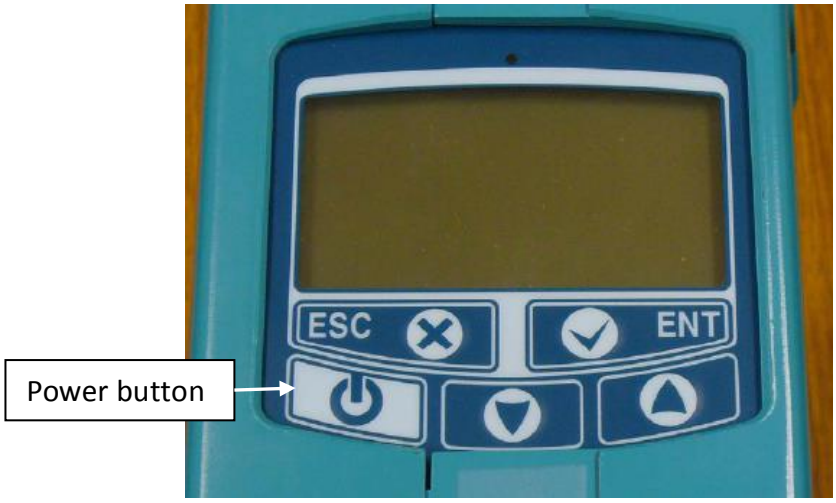
- **Vapor concentration units**: The "regular" Lumex (the RA-915+) reports in nanograms per cubic meter (ng/m^3) while the Lumex Mini (as well as the Lite) reports in micrograms per cubic meter ($\mu g/m^3$). Be sure to use the correct units when comparing readings to screening levels! The machine's screen shows the units.
- **Test cell**: You do not manually enter a test cell for the Lumex Mini. The system check is all internal. Instead of an "R" value, the Mini shows a "D" value (just a letter change – value means the same).
- **Muffler**: There is no muffler to attach to the Mini's exhaust outlet.
- **Lamp**: The lamp in the Mini is automatic. You don't have to light it manually.
- **Readout**: Similar to the regular and Lite Lumex, the Mini's screen will show the real-time (S) and 10-second average (S_i) reading,. But, it will also show three 10-second averages and the average of those (S_a) – see directions.

Side view (with cloth case)

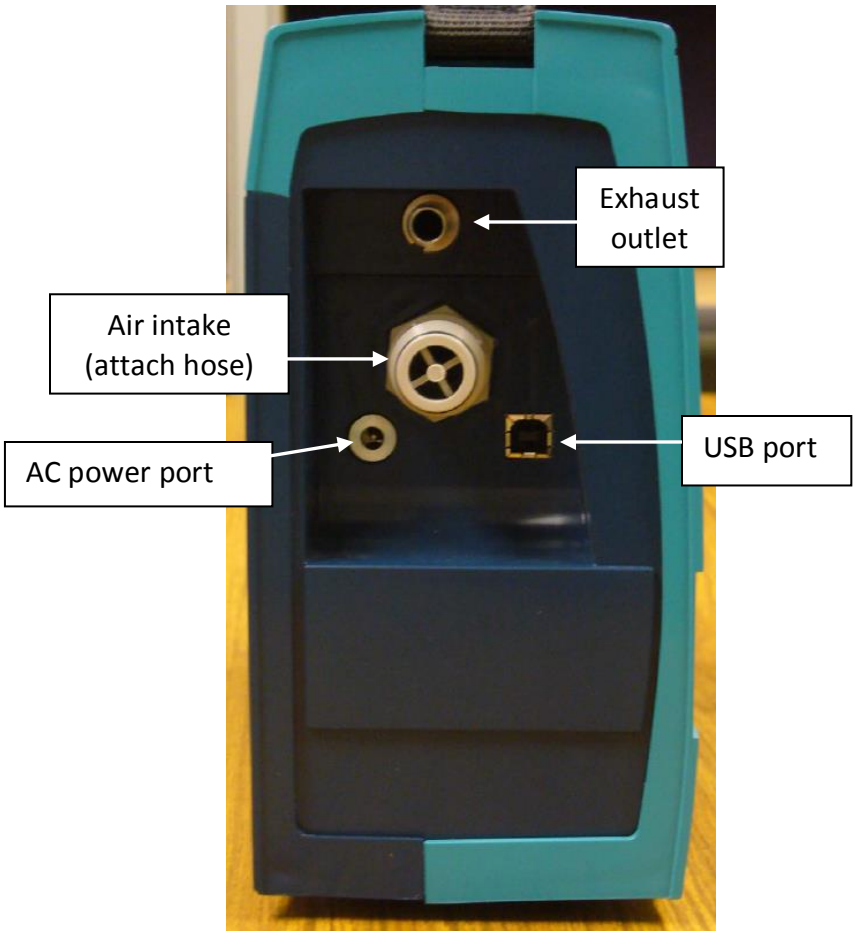
It is easier to carry the machine in the cloth case. The cloth case covers the screen, front panel, and connections for the webbing handle. Open the flaps over the front panel and the top display screen to access the buttons and attachment locations.



Side view (without the cloth case)



Top display screen of Lumex Mini (off)

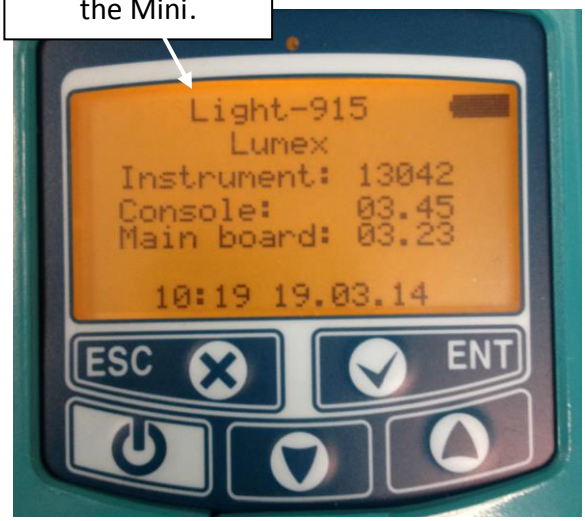


Attachment panel of the Lumex Mini

Analyzer set-up

1. Attach the plastic hose's coupling into the inlet. Make sure the attachment is secure.
2. Optional: Attach the sampling wand to the other end of the hose. Make sure the attachment is secure, to prevent leaks. Note that the wand telescopes, if needed. Also, there is a small opening in the handle of the wand that closes with a sliding cover. Keep the cover closed.

3. Push the **Power** switch until the display screen comes on. The battery icon in the upper right will indicate level of charge, solid black being fully charged. (If the battery has not been charged, it may not turn on. Run on AC power – you may need an extension cord for the screening.) The screen will show the machine's information. It will also show the time (24-hour) and the date (day.month.year).



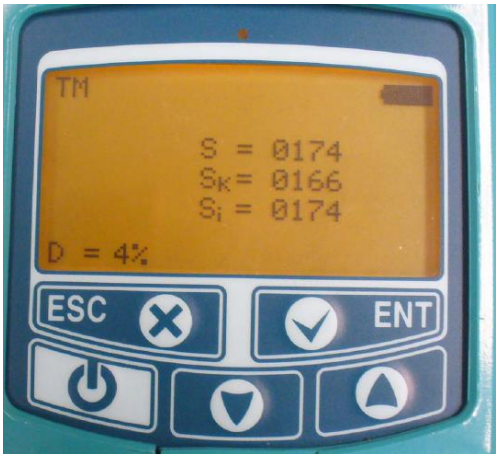
4. Push the **Enter (Ent)** key. The screen will display a menu. (On Stream will be highlighted.)

5. Wait about 5 minutes for the machine to warm up and acclimate to the temperature in which you will be using it. During this time, you may want to discuss with the property owner/occupant how you'll be conducting the investigation, what numbers you'll be looking for, and collect any other information from them that might be relevant.

Run Test

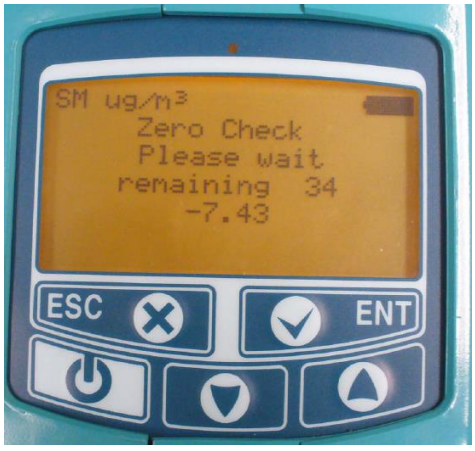
6. Use the **Down arrow** key to select the menu line for **Test** and then press the **Enter (Ent)** key. This test will check the serviceability of the machine. (Basically, the accuracy of repeated readings from a steady source of mercury [test cell].)

7. The machine will test itself automatically. A countdown of 10 seconds will run in the lower right of the screen. On the screen, **S** is the concentration the machine is reading every second, $\mathbf{S_k}$ is the known vapor concentration (there is a cell of mercury inside the machine with a known vapor concentration of mercury), and $\mathbf{S_i}$ is the 10-second average of the readings. The **D** value is the relative deviation. If **D** is less than 20%, the analyzer is ready for use. If **D** is greater than 20%, press the **Escape (Esc)** key, wait 10 minutes and run the test again. See the Troubleshooting section for further details, if necessary.
8. When the **D** value is acceptable, record it on your investigation form, if using one. Then press the **Escape (Esc)** key. You will return to the main menu.

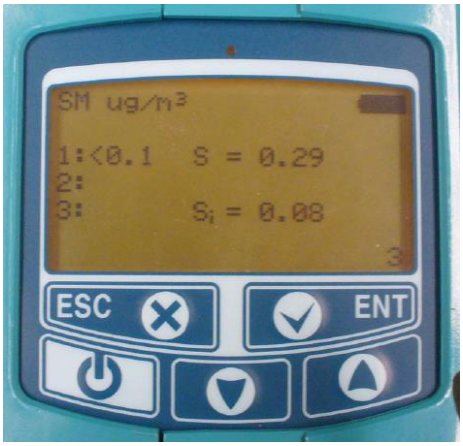


Run the analyzer for a mercury screening

9. At the main menu, select the **On Stream** line and press the **Enter (Ent)** key. The machine will run a zero check. *Do not set the machine down on any surfaces suspected of being contaminated.*

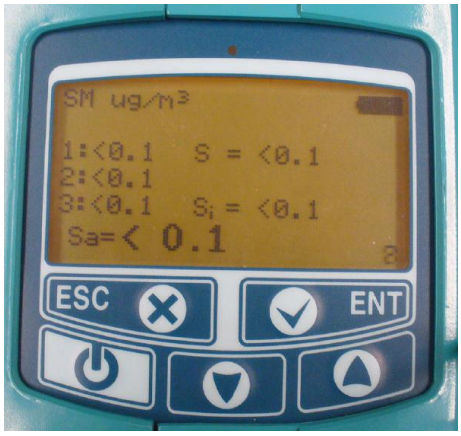


10. The machine will start reporting real-time mercury level readings in units of **micrograms per cubic meter (µg/m^3) of air**. When it first shows readings, the initial numbers may be still be elevated from the test run. Let one or two 10-second averages cycle through, to allow the test vapors to clear and the room vapors to start registering. The 10-second countdown is in the lower right corner.



11. **S** is the real-time concentration, **S_i** is the 10-second average. **Use these readings to evaluate the situation.**

    [The screen will also show three consecutive 10-second averages (as **1, 2**, and **3**), then the average of those (**S_a**). These 10-second averages are *not* continuously renewed. To clear them out for another set, the operator must push ENT. *Only very experienced operators should use these readings*.]



16. When you are finished sampling, push the **Escape (Esc)** key to stop the airflow. Turn off the machine and remove hose and sampling wand. Store the machine, display screen facing toward case handle, and all components in its hard case.

If you have any questions or encounter problems, please read the troubleshooting section below or contact the Toxicology and Response Section at **1-800-648-6942**

Troubleshooting:

Problem	**Possible cause**	**Correction**
Parts/all of the display go out	Battery is discharged	Connect the charger to the AC power port and plug in to an outlet to charge. If using the machine, plug the charger into an extension cord to allow movement.
The battery is not charged within 5 hours	1. No connection 2. Charger failure 3. Internal battery failure	1. Verify connection 2. Verify charger works 3. Replace battery (see manual)
In the Test mode, D is more than 20%	Ambient temperature is not 20 ± 5° C (about 68 ± 40° F).	Wait for proper operating temperature or see manual to take into account the complementary error.
"Lamp is not ignited" is shown on the Main Menu	Lamp ignition failure	Turn off analyzer, then turn back on. If the problem is not solved, replace the mercury lamp (see manual).
"Low radiation" sign (a dot) is shown on the screen (there may be a sound)	Mercury lamp failure	Replace the mercury lamp (see manual).
The machine does not respond when any button is pressed	Hardware bust	Press simultaneously the Power button and the Esc button, to restart the analyzer.

Contact numbers:

MDCH (business hours)	1-800-648-6942
National Response Center (NRC) – for reporting over 1 pound of mercury spilled (24/7)	1-800-424-8802
EPA On-Scene Coordinators (OSCs)	312-353-2318