Table of Contents

1.0 Purpose and Scope

2.0 Responsibility

3.0 Precautions

4.0 Quality Assurance

5.0 DMT Access Levels

6.0 Location Requirements

7.0 Supervisor Duties

8.0 Supervisor Functions

9.0 Simulator Solution Change

10.0 Routine Performance Check

11.0 DMT Components

12.0 Error Messages and Responses

13.0 Abbreviations

14.0 References

15.0 Appendices

1. Purpose and Scope

1.1. The purpose of this manual is to describe the process used by DMT Supervisors in the basic operation, maintenance, and record keeping associated with the Intox DMT infrared breath alcohol testing instruments. DMT Supervisors are individuals designated by various law enforcement agencies to act as a liaison between DMT operators and VFL staff. DMT Supervisors are trained by qualified VFL DMT technicians and are certified to perform basic instrument maintenance and troubleshooting. This manual does not cover all troubleshooting and error conditions which may be encountered in the maintenance of the DMT units, but does provide guidance for the majority of circumstances that may arise.

1.2. The goal of the DMT Supervisor Manual is to provide guidance and written procedures that are used by DMT Supervisors in the basic maintenance of the DMT evidentiary breath alcohol testing instruments. The information provided in this manual is not designed to make the DMT Supervisor an expert on the DMT, but will familiarize the Supervisor with the instrument in order to perform simple maintenance and repairs and to provide copies of records as needed. An understanding of mechanics, optics, and electronics is not required to be certified as a DMT Supervisor.

2. Responsibility

2.1. It is the responsibility of DMT Supervisors performing these tasks to follow the procedure as written and to note any omissions, errors, or unclear instructions in the procedure and bring them to the attention of the VFL Toxicology Section.

2.2. This manual will be reviewed periodically by Toxicology Section staff. Revisions of the manual will be made when a need is identified.

2.3. All individuals performing these procedures must be fully trained by a qualified VFL DMT technician and demonstrate competency in the use of these procedures before being certified as a DMT Supervisor.

2.4. **It is the responsibility of the DMT Supervisor to direct any questions or concerns regarding the DMT to the VFL Toxicology Section at DPS.DMT@vermont.gov or by calling the VFL.**

3. Precautions

3.1. Appropriate caution must be taken to avoid electrical shock when working with or using any electrically charged equipment.

3.2. Care should be taken when handling the DMT and the attached simulator. Do not apply undue pressure or torque onto the DMT simulator jar as the glass may break.

4. Quality Assurance

4.1. If a DMT is not able to meet the performance expectations set forth in this manual, it is the responsibility of the DMT Supervisor to have the DMT removed from service. The VFL Toxicology Section will contact the DMT Supervisor if an issue arises and will work with the impacted agency if the DMT Supervisor is unable to complete this in a timely manner.

4.2. It is expected that the DMT Supervisor will report any unacceptable or anomalous behavior regarding the operation or use of the DMT immediately to the VFL Toxicology Section. It is further expected that appropriate actions will follow as soon as possible and be properly documented.

4.3. Periodic software updates or maintenance may be necessary to keep up with changing needs in the DMT user interface. It is the responsibility of the DMT Supervisor to ensure members of the VFL Toxicology Section are able to access the DMTs in a timely manner to perform any necessary maintenance or updates.

5. DMT Access Levels

5.1. Operator Level – No password required

5.1.1. Administer DUI and Check-In breath tests

5.1.2. Print a copy of last breath report generated

5.2. Supervisor Level – Password required

5.2.1. Access to all options available to an operator

5.2.2. Reprint reports

5.2.3. Export data, as needed

5.2.4. Perform Simulator Solution Change (SSC)

5.2.5. Perform Routine Performance Check (RPC)

5.2.6. Perform Diagnostic test

5.2.7. Perform Accuracy and Precision test (A&P)

5.2.8. View technician screen

5.2.9. Purge the sample chamber

5.2.10. Remove/Return instrument from/to service

5.3. Technician level – Only available to VFL Toxicology Section staff

6. Location Requirements

6.1. An instrument cannot be installed for evidentiary use at a location unless the host agency agrees to the following:

6.1.1. Provide personnel to be trained and available to perform the duties of a DMT Supervisor.

6.1.2. Keep a complete record of use and maintenance, and when required, submit copies of records to the VFL Toxicology Section or other requesting agencies.

6.1.3. Maintain the instrument and surrounding area in which it is installed according to the initial specifications and meet any subsequent modifications required by the VFL.

6.2. The VFL Toxicology Section may withdraw approval of a site if:

6.2.1. The host agency has failed to adhere to the conditions listed above.

6.2.2. The instrument is being underutilized.

6.2.3. There are reasons which make the site unsatisfactory for continued DMT use.

6.3. Access and instrument security

6.3.1. Access by appropriate personnel and certified law enforcement officers for maintenance and processing DUI subjects should be allowed 24 hours per day, 7 days per week.

6.3.2. The DMT should never be accessible to unsupervised, unauthorized persons.

6.3.3. The supervisory functions of the DMT should not be accessible to unauthorized persons at any time. If you step away from the instrument, log off. Do not give out the password or security screwdriver.

6.4. Cleaning and ventilation

6.4.1. The instrument and surrounding area should be kept clean with limited dust or dirt accumulation.

6.4.2. The instrument cover and supporting surface may be cleaned with a damp cloth.

6.4.3. Cleaning supplies and other chemicals should not be stored near the instrument.

6.4.4. The room should have adequate ventilation to facilitate cooling of the instrument and minimize the presence of potentially interfering substances.

6.4.5. Nothing should be placed behind, underneath or around the instrument that would obstruct ventilation of the instrument.

6.4.6. Beverages or other liquids should not be placed on or in the vicinity of the instrument.

6.5. Power requirements

6.5.1. Power to the DMT should be provided from a low use 15 amp minimum, grounded 120 VAC ± 10% line which operates at a frequency of 60HZ.

6.5.2. The DMT is to be plugged into the supplied line conditioner or an approved uninterruptible power supply (UPS).

6.6. Ethernet Access

6.6.1. A dedicated Ethernet port is recommended to connect the DMT to the DPS Intranet.

6.7. Temperature Requirements

6.7.1. While the DMT is in use the room temperature should be maintained between 65ºF and 78ºF.

6.7.2. A fan, dehumidifier, heater, or air conditioner may be used to control the room temperature and humidity; however nothing should be blowing directly on the instrument.

6.8. Moving an instrument

6.8.1. Contact the VFL Toxicology Section if there is a need to move an instrument beyond the length of the power cord.

6.8.2. Two (2) weeks advance notice should be given if there is a need to move an instrument or there will be a modification to an existing DMT location, such as building renovations.

6.8.3. In the event of an emergency or a natural disaster (e.g. flood, extreme cold, major building damage, etc.) and the DMT can be moved without compromising safety, please move the instrument to a secure location and contact the VFL as soon as possible.

7. Supervisor Duties

7.1. Maintain instrument security.

7.2. Maintain DMT records and provide record updates to the VFL Toxicology Section.

7.2.1. The DMT Supervisor will ensure the DMT Maintenance Log is maintained.

7.2.2. The Supervisor will file all generated maintenance reports in a dedicated DMT records binder.

7.2.3. Copies of log book(s) should be sent to the VFL Toxicology Section periodically, preferably monthly.

7.2.4. If the DMT is NOT connected to an Ethernet port, a manual download of the DMT data may need to be provided. Contact the VFL Toxicology Section for information.

7.3. Manage DMT supplies

7.3.1. DMT supplies, including simulator solution, mouthpieces, and blood kits, should be routinely inventoried.

7.3.2. Additional DMT supplies may be requested by contacting the VFL Toxicology Section at DPS.DMT@vermont.gov.

7.3.3. All empty or expired bottles of solution should be returned to the VFL.

7.3.4. DMT supplies should be ordered as needed and not stockpiled.

7.4. Monitor simulator solution

7.4.1. When a new simulator solution is added, the certified concentration of the solution is entered into the DMT. The instrument will calculate a ±5% accuracy acceptance range based on this concentration. If, while running a test, the simulator vapor result is outside ±5%, the instrument will display the error "Simulator Out of Range" and will not allow a subject sample to be collected until a passing simulator result is obtained.

7.4.2. DMT Supervisors should periodically review recent breath records for simulator vapor results. If the solution appears to be nearing the -5% acceptance value, it is recommended the Supervisor perform a simulator solution change.

7.4.3. In addition to periodic checks, is also recommended the simulator solution be checked before historically high-volume breath testing occasions or an extended leave of a DMT supervisor. This can be done by running an accuracy and precision check as described in this manual.

7.4.4. Each bottle of simulator solution is labeled with the lot number, certified value, acceptance range, preparation date and expiration date. When changing solutions, use the oldest solutions first. See simulator solution label example below.

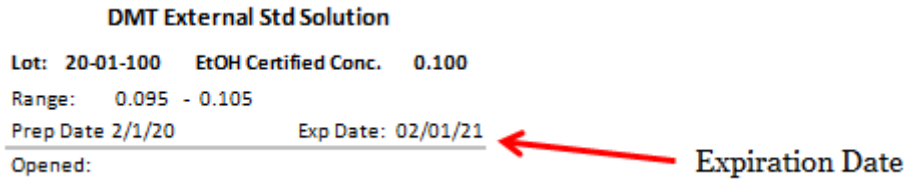


Figure 1. Simulator Solution Expiration Label Example

7.4.5. The expiration date refers to the date in which the solution expires in the bottle. In this example, the solution may be poured into the simulator on or before 02/01/2021 and is permissible for use until the next required RPC or solution change.

7.5. Printer maintenance

7.5.1. Each agency is responsible for maintaining their own printer including: replacement ink cartridges, print heads, and paper. Extra printer supplies should be kept on hand at all times.

7.5.2. If a printer is inoperable and appropriate troubleshooting has not resolved the issue, contact the VFL Toxicology Section for a replacement printer.

7.6. Support DMT operators

7.6.1. DMT Supervisors act as a liaison between DMT operators and VFL staff. DMT Supervisors should address concerns or questions of DMT operators and respond accordingly. DMT Supervisors are responsible for relaying information from VFL staff to DMT operators at their agency including but not limited to: changes to processes, software updates, etc.

7.7. Performing basic instrument maintenance

7.7.1. Supervisor functions and specific protocols are described in detail below.

7.8. Communication with VFL staff

7.8.1. All DMT questions and concerns should be reported by the DMT Supervisor to the VFL Toxicology Section as soon as possible.

8. Supervisor Functions

8.1. Logging on and logging off

8.1.1. After selecting a protocol, the instrument will prompt the user to enter a password. Once a password is entered, the home screen will display the access level in the lower right corner.

8.1.2. **Always log off when finished with the instrument.**

8.1.3. You may also log on/off manually using the procedure below.

8.1.4. Log On

8.1.4.1. Touch the screen to deactivate the screen saver.

8.1.4.2. Touch the DMT logo in the top left corner of the screen to open the drop-down menu.

8.1.4.3. Select “Security” → “Enter Password” and enter password.

8.1.5. Log Off

8.1.5.1. Touch the DMT logo in the top left corner of the screen to open the drop-down menu.

8.1.5.2. Select “Security” → “Log Off”.

8.2. Reprinting reports

8.2.1. Touch the screen to deactivate the screen saver.

8.2.2. Touch the DMT logo in the top left corner of the screen to open the drop-down menu.

8.2.3. Select “Reports”.

8.2.4. The right side of the screen lists all records stored on the instrument sorted by type.

8.2.5. Touch the + symbol next to a report type to open the drop-down list of reports sorted by date and time.

8.2.6. If more than one (1) record was generated on a date, open the reports for the date in question by touching the + next to the date.

8.2.7. Select the desired report by highlighting it on the right side of the screen. The report highlighted will be displayed on the left side of the screen.

8.2.8. When you have selected the report desired, press “Print”.

8.2.9. You will be given the options of printing a paper copy, printing an electronic copy to a USB storage device, or both. Select the printing method desired and press “OK”.

8.2.10. Exit and log off when all printing is complete.

8.3. Simulator Solution Change (SSC)

8.3.1. See Section 9 for full procedure on completing a Simulator Solution Change.

8.4. Routine Performance Check (RPC)

8.4.1. See Section 10 for full procedure on completing a Routine Performance Check

8.5. Diagnostic test

8.5.1. The Diagnostic test checks software, hardware, optics, and mechanical function.

8.5.2. To perform a Diagnostic test:

8.5.2.1. Touch the screen to deactivate the screen saver.

8.5.2.2. Touch the DMT logo in the top left corner of the screen to open the drop-down menu.

8.5.2.3. Select “Diagnostic”.

8.5.2.4. Once the test is complete and the report prints, log off.

8.5.3. See Appendix A for an example of a Diagnostic report.

8.6. Accuracy and Precision Check (A&P)

8.6.1. The Accuracy and Precision check will run ten replicate samples of the simulator solution and report the simulator vapor concentration and standard deviation.

8.6.2. To perform an Accuracy and Precision check:

8.6.2.1. Touch the screen to deactivate the screen saver.

8.6.2.2. Touch the DMT logo in the top left corner of the screen to open the drop-down menu.

8.6.2.3. Select “Accuracy and Precision”.

8.6.2.4. Once the test is complete and the report prints, log off.

8.6.3. See Appendix A for an example of an Accuracy and Precision check report.

8.7. Technician screen check

8.7.1. VFL staff may request the DMT Supervisor access the technician screen and relay information to a DMT Technician.

8.7.2. The technician screen displays voltages, temperatures, and filter readings for the instrument.

8.7.3. To access the technician screen:

8.7.3.1. Touch the screen to deactivate the screen saver.

8.7.3.2. Touch the DMT logo in the top left corner of the screen to open the drop-down menu.

8.7.3.3. Select “Technician Mode”.

8.7.3.4. When finished, exit and log off.

8.7.4. See Appendix A for a screenshot of the technician screen.

8.8. Purging the sample chamber

8.8.1. To purge the sample chamber:

8.8.1.1. Touch the screen to deactivate the screen saver.

8.8.1.2. Touch the DMT logo in the top left corner of the screen to open the drop-down menu.

8.8.1.3. Select "Functions" → "Purge Sample Chamber".

8.8.1.4. Allow the instrument to purge for 1-2 minutes unless otherwise instructed.

8.8.1.5. When finished, exit and log off.

8.9. Remove and return the instrument from service

8.9.1. To remove the instrument from service:

8.9.1.1. Touch the screen to deactivate the screen saver.

8.9.1.2. Touch the DMT logo in the top left corner of the screen to open the drop-down menu.

8.9.1.3. Select "Functions" → "Remove From Service".

8.9.1.4. The screen will now display "Out of Service" in the bottom left corner of the screen where "Ready, Push Run" would be.

8.9.1.5. Log off.

8.9.2. To return the instrument to service:

8.9.2.1. Touch the screen to deactivate the screen saver.

8.9.2.2. Touch the DMT logo in the top left corner of the screen to open the drop-down menu.

8.9.2.3. Select "Functions" → "Return to Service".

8.9.2.4. The screen will now display "Ready, Push Run" in the bottom left corner.

8.9.2.5. Log off.

8.9.3. Note: If the DMT was removed from service pending routine maintenance, such as an RPC, it will need to be returned to service in order to run the necessary protocol. DMT maintenance protocols cannot be run while the DMT is out of service.

9. Simulator Solution Change (SSC)

9.1. Gather supplies: a bottle of simulator solution and a few paper towels.

9.1.1. Ensure the solution is not expired. The expiration date means that the solution must be placed in service prior to that date. It does not mean that the solution has to be removed by that date (see section 7.4 for expiration date clarification).

9.2. Turn off the simulator.

9.3. Disconnect the two cables from the simulator head and the quick connects from the simulator ports. (see section 11, figure 7)

9.4. Unscrew the simulator head from the simulator jar. Discard the used simulator solution and using a clean paper towel, carefully wipe the simulator head mechanism and jar mostly dry.

9.5. Inspect the simulator components, rubber gasket, and jar for apparent damage.

9.6. Pour the new simulator solution into the jar avoiding splashing and glugging.

9.7. Replace the simulator head. Ensure the simulator jar is properly threaded to the simulator head. It should be snug. Do not over tighten.

9.8. Plug the two cables into the simulator head and turn on. Ensure the paddle is rotating.

9.9. Reconnect the simulator head to the side of the instrument.

9.10. Affix one (1) simulator solution label to the top of the simulator head and note the date opened and your initials.

9.11. Affix the other simulator solution label to the DMT Maintenance Log. Under the label write “Simulator Solution Change” or “SSC”. Write your name and date where indicated.

9.12. Wait for the simulator temperature to read ~34.00ºC.

9.13. Touch the screen to deactivate the screen saver.

9.14. Touch the DMT logo in the top left corner of the screen to open the drop-down menu.

9.15. Select “Protocols” → “Simulator Solution Change” and enter password.

9.16. Enter your name, the solution concentration, and the lot number in the required fields. Refer to the sticker on the bottle of simulator solution and ensure that the correct lot number and target value are entered. Press “OK”.

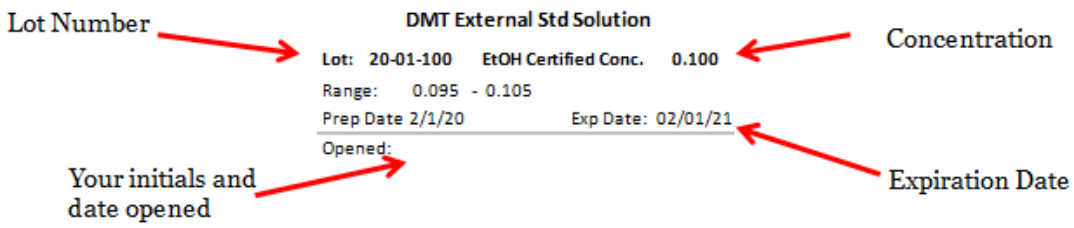


Figure 2. Example of a simulator solution label.

9.17. The DMT will count down from 30 minutes while the solution equilibrates. The instrument will automatically begin its checks once the timer has concluded.

9.18. Accuracy and Precision Check.

9.18.1. Five (5) replicates of the simulator vapor will be analyzed.

9.18.2. The instrument will calculate a ±5% acceptance range of the simulator vapor concentration based on the certified value entered.

9.18.3. The calculated standard deviation must be less than 0.0020.

9.18.4. If the DMT does not meet the accuracy and precision requirements above, the DMT will abort the test. The DMT will be removed from service until a passing SSC can be completed.

9.19. Once a passing SSC is complete, the instrument will prompt for the Supervisor's signature. Sign the box and press "Accept" to complete. The report will print and an electronic copy will be transmitted to the VFL Toxicology Section.

9.20. File the paper copy with your onsite DMT maintenance records. If any failing reports are generated prior to receiving a passing SSC, those should be kept with the passing report.

9.21. See Appendix A for an example of a Simulator Solution Change report.

10. Routine Performance Check (RPC)

10.1. Routine Performance Checks are required during the months of **February, June, and October** of each year. The RPC protocol may be performed up to 15 days prior to the beginning of an RPC month. A reminder will be displayed on the DMT home screen starting on the first of the months of February, June, and October. The reminder states "*RPC Check Now Due*". If the RPC is not completed before the end of the required month, the instrument will automatically be removed from service until such time as a passing RPC is completed. The instrument will display "*RPC Check Required*".

10.2. Gather Supplies:

10.2.1. A bottle of simulator solution and a few paper towels.

10.2.1.1. Ensure the solution is not expired. The expiration date means that the solution must be placed in service prior to that date. It does not mean that the solution has to be removed by that date (see section 7.4 for expiration date clarification).

10.2.2. A handheld portable radio.

10.2.3. A mouthpiece.

10.3. Turn off the simulator.

10.4. Disconnect the two cables from the simulator head and the quick connects from the simulator ports. (see section 11, figure 7)

10.5. Unscrew the simulator head from the simulator jar. Discard the used simulator solution and using a clean paper towel, carefully wipe the simulator head mechanism and jar mostly dry.

10.6. Inspect the simulator components, rubber gasket, and jar for apparent damage.

10.7. Pour the new simulator solution into the jar avoiding splashing and glugging.

10.8. Replace the simulator head. Ensure the simulator jar is properly threaded to the simulator head. It should be snug. Do not over tighten.

10.9. Plug the two cables into the simulator head and turn on. Ensure the paddle is rotating.

10.10. Reconnect the simulator head to the side of the instrument.

10.11. Affix one (1) simulator solution label to the top of the simulator head and note the date opened and your initials.

10.12. Affix the other simulator solution label to the DMT Maintenance Log. Under the label write "'Month' Routine Performance Check" or "RPC". Write your name and date where indicated.

10.13. Wait for the simulator temperature to read ~34.00ºC.

10.14. Touch the screen to deactivate the screen saver.

10.15. Touch the DMT logo in the top left corner of the screen to open the drop-down menu.

10.16. Select "Protocols" → "Routine Performance Check" and enter password.

10.17. Enter your name, the solution concentration, and the lot number in the required fields. Refer to the sticker on the bottle of simulator solution and ensure that the correct lot number and target value are entered. Press "OK".

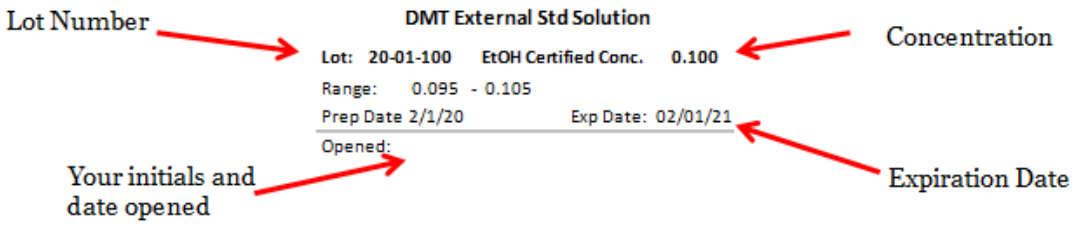


Figure 3. Example of a simulator solution label.

10.18. The DMT will count down from 30 minutes while the solution equilibrates. The instrument will automatically begin its checks once the timer has concluded.

10.19. Diagnostic check

10.19.1. The instrument will perform a self-check of software, hardware, optics, and mechanical function to ensure all specifications are met.

10.19.2. If any of the specifications are out of range, the DMT will abort the test.

10.20. Accuracy and Precision Check

10.20.1. Five (5) replicates of the simulator vapor will be analyzed.

10.20.2. The instrument will calculate a ±5% acceptance range of the simulator vapor concentration based on the certified value entered.

10.20.3. The calculated standard deviation must be less than 0.0020.

10.20.4. If the DMT does not meet the accuracy and precision requirements above, the DMT will abort the test. The DMT will be removed from service until a passing RPC can be completed.

10.21. Radio Frequency Test (RF Test)

10.21.1. A box will appear on the screen displaying: "RFI Test", "Detector Voltage" beside an indicator of actual detector voltage, and two radio buttons labeled "Abort" and "Fail".

10.21.1.1. It is normal for the detector voltage to fluctuate a small amount; however, the detector voltage should **NOT** change by more than 0.003V.

10.21.1.2. If the detector voltage changes by more than 0.003V and radio frequencies (RF) are **NOT** detected, press "Fail" to stop the test, remove the instrument from service and contact the VFL Toxicology Section.

10.21.2. Key a handheld radio in close proximity to the breath tube.

10.21.2.1. The detector voltage should change significantly and the DMT should report "RF Detected." The instrument will beep twice and will immediately move on to the Sample Acceptance test.

10.21.3. If the DMT does not detect RF, there are two options to abort the testing sequence.

10.21.3.1. Aborting the RF test

10.21.3.1.1. If you need to cancel the RF test, press "Abort." A dialog box will pop up allowing you to enter the reason why the test was aborted.

10.21.3.1.2. Example reasons for aborting RF test may include: did not have radio on hand, ran out of time, had to leave for another incident, processing room needed for another incident, needed to answer a call, etc.

10.21.3.1.3. If the test is aborted, remove the instrument from service until a passing RPC can be completed.

10.21.3.2. Failing the RF Test

10.21.3.2.1. If the DMT fails the RF test, press "Fail."

10.21.3.2.2. Example reasons for failing the RF test: The DMT does not detect RF when the radio is keyed or the detector voltage shifts more than 0.003V and the DMT does not flag RF.

10.21.3.2.3. If the DMT fails the RF test, remove the instrument from service and contact the VFL Toxicology Section.

10.22. Sample Acceptance Test

10.22.1. Press "OK" when you are ready to start the test.

10.22.2. The DMT will run through a series of quality control checks.

10.22.3. When prompted "Please Blow" and an intermittent tone is heard, insert a new mouthpiece into the breath tube.

10.22.4. A proper Sample Acceptance Test consists of 3 types of samples: a shallow breath, intermittent breath, and a valid, ~1.5 L alcohol-free sample. During the testing sequence, the bottom left corner of the screen will display each instruction for fifteen (15) seconds for each type of breath. It may not be necessary to use the entire fifteen seconds per sample type. A proper Sample Acceptance Test graph should look like the one below.

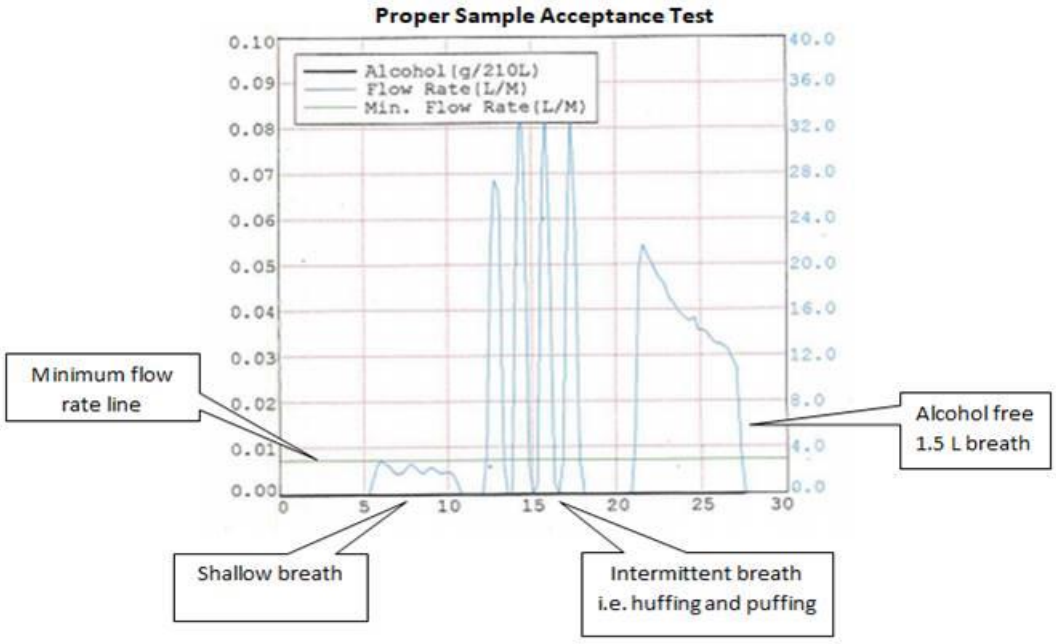


Figure 4. Proper Sample Acceptance Example

10.22.4.1. **Shallow Breath**: Place the mouthpiece between your teeth or lips, but keep the corners of your mouth open. Blow a small amount of air into the mouth piece, allowing the majority of air to escape out the sides of your mouth. The air flow should be gentle, but strong enough to register on the screen. Blow for a few seconds then stop. The air flow line (blue) should "ride" the minimum flow rate line (green) for 2-3 seconds.

10.22.4.2. **Intermittent Breath**: Blow 3-4 short, somewhat forceful breaths into the mouth piece for 1-2 seconds. This is similar to blowing up a balloon, but with quick breaths. Be careful not to suck back on the mouth piece between puffs of air.

10.22.4.3. **1.5 L Alcohol Free Sample:** While watching the total volume box in the bottom right corner of the screen, take a deep breath and exhale into the instrument with a steady breath flow rate and provide a sample equal to or slightly larger than 1.5 L of air. The instrument should accept a sample that is at least 1.5 L of air.

10.22.5. Once the last sample has been provided to the instrument, it will end the testing sequence.

10.22.6. A box will pop up asking "Did Instrument Pass All Sample Acceptance Checks? Yes/No"

10.22.6.1. If the sample acceptance passes, select "Yes" and move on to the next step.

10.22.6.2. If the sample acceptance test fails, select "No". The instrument will then prompt the operator to enter a reason for the failure. Enter the reason for the failure and contact the VFL Toxicology Section.

10.22.6.3. If the shallow or intermittent breath test was accepted by the instrument as a valid breath (meaning it ended the testing sequence) the test is considered failing.

10.22.6.4. **If the alcohol line (black) is elevated at any point during the sample acceptance test, the test is considered failing.**

10.23. Once a passing RPC is complete the instrument will prompt for the Supervisor's signature. Sign the box and press "Accept" to complete.

10.24. File the paper copy with your onsite DMT maintenance records. If any failing reports are generated prior to receiving a passing RPC, those should be kept with the passing report.

10.25. If the DMT is **NOT** connected to an Ethernet port, a color copy of the RPC report should be sent to the VFL Toxicology Section.

10.26. See Appendix A for an example of a Routine Performance Check report.

11. DMT Components

11.1. External components

Figure 5. Front view of the DMT

Figure 6. Back panel view of the DMT

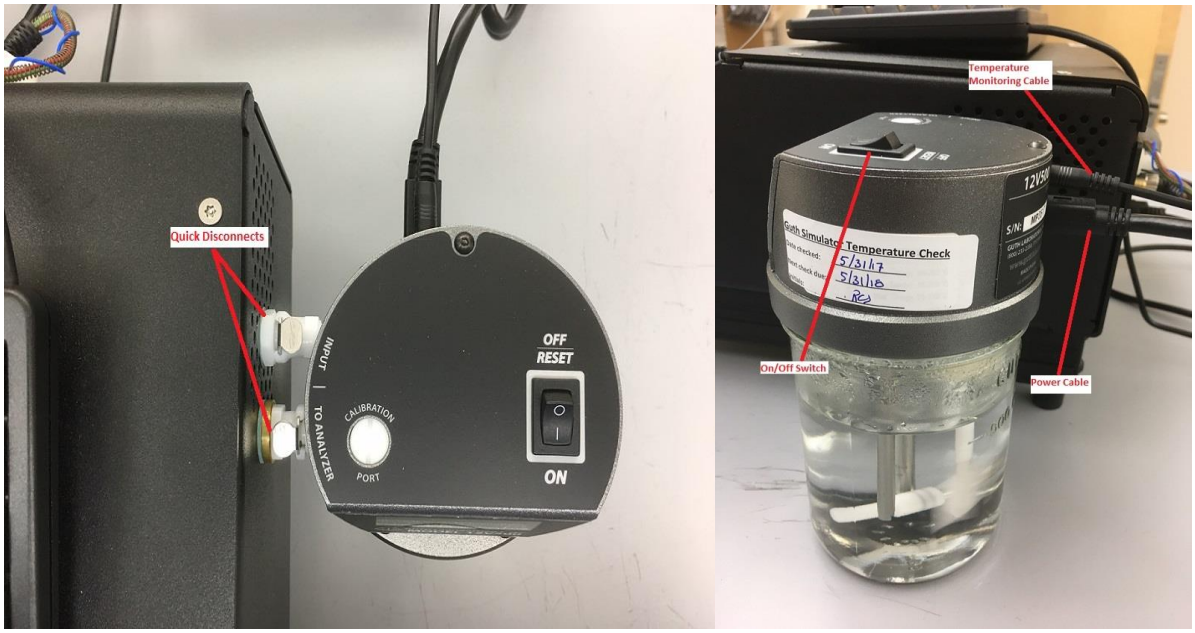


Figure 7. Top and side view of simulator including: simulator quick connects, power cable, temperature monitoring cable, and power switch

11.2. Internal components

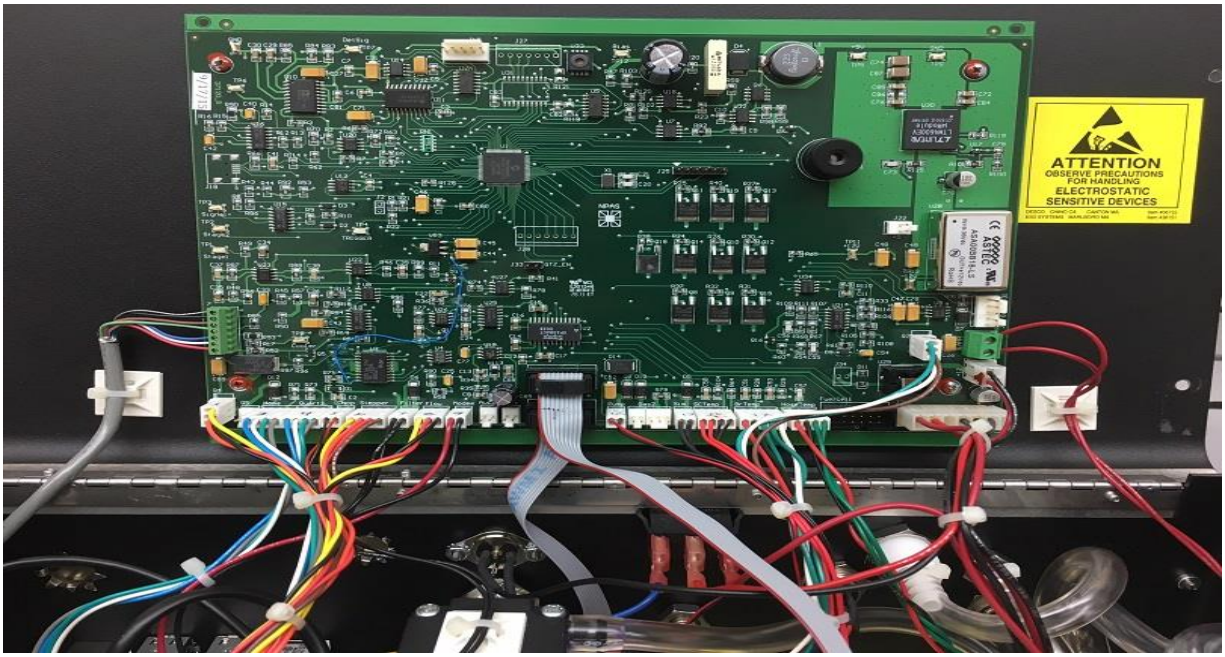


Figure 8. Internal view of the DMT lid including controller board

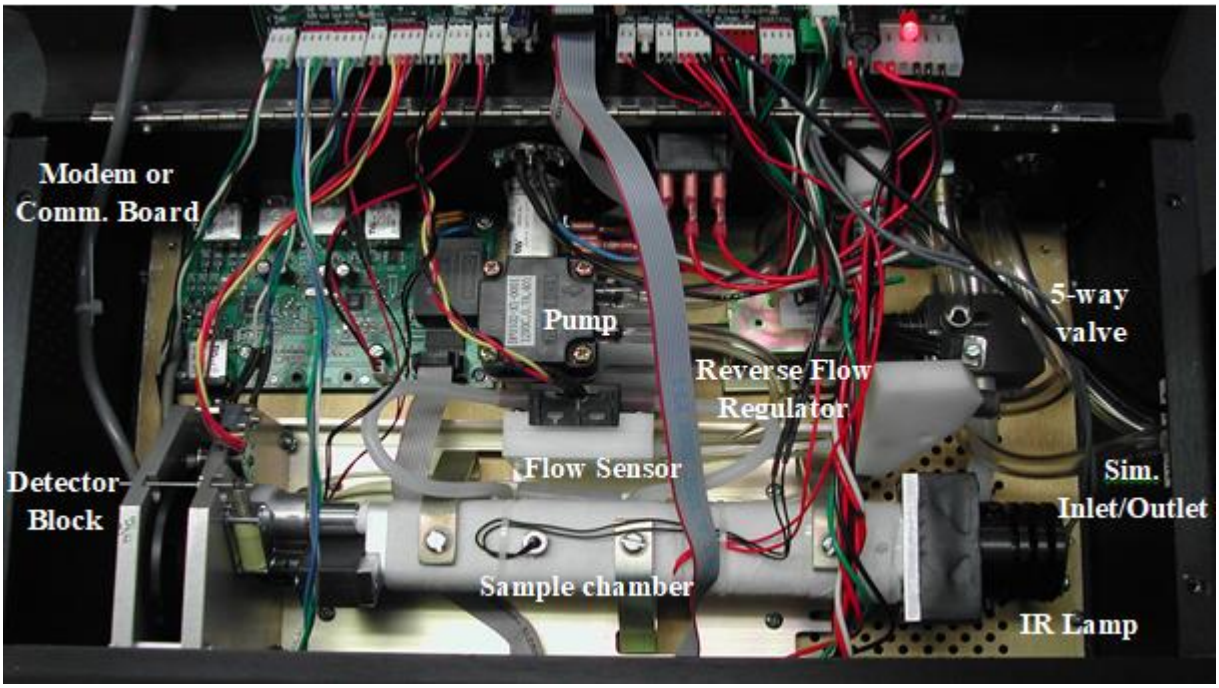


Figure 9. Internal view of the DMT with labeled parts

12. Error Messages and Responses

12.1. If any of the following error messages or conditions occurs, follow the procedures as described below.

12.2. For common error conditions and appropriate responses, you may also reference the DMT Quick Troubleshooting Guide in Appendix _A copy of this troubleshooting guide should be placed in a readily visible spot near the DMT, such as an adjacent wall.

12.3. All actions taken on a DMT to remedy a condition or error message should be documented in the DMT Maintenance Log.

12.4. If the error occurs on more than one occasion or you are unable to remedy a condition or error, remove the instrument from service and contact the VFL Toxicology Section immediately.

12.5. When contacting the VFL Toxicology Section, provide the following information:

12.5.1. Your name, phone number, location and DMT serial number.

12.5.2. The error message and/or condition that has occurred. Be as SPECIFIC as possible when reporting the error as some error messages are similar but may require different solutions.

12.5.3. Test results during and after the error message or condition.

12.5.4. What steps you have taken in an attempt to remedy the situation.

12.6. **Ambient Fail**: The DMT is detecting alcohol in the room air.

12.6.1. Move the subject away from the DMT and draw fresh air into the room by opening a door or window or turning on a fan.

12.6.2. Remove the mouthpiece from the breath tube, if attached.

12.6.3. Remove possible contamination sources from the processing area (e.g. hand sanitizer, cleaning reagents, alcohol prep pads, etc.).

12.6.4. If the error persists, purge the sample chamber for approximately 5 minutes.

12.7. **Blank Error**: The instrument is detecting apparent alcohol in the air.

12.7.1. Move the subject away from the DMT and draw fresh air into the room by opening a door or window or turning on a fan.

12.7.2. Remove the mouthpiece from the breath tube, if attached.

12.7.3. Remove possible contamination sources from the processing area (e.g. hand sanitizer, cleaning reagents, alcohol prep pads, etc.).

12.7.4. If the error persists, purge the sample chamber for approximately 5 minutes.

12.8. **BUSY – Please Wait**: The DMT froze while attempting to upload records to the intranet.

12.8.1. Allow at least one minute for this message to go away. Do not push any buttons or attempt to run tests on the DMT while this message is displayed.

12.8.2. If the message persists for longer than one (1) minute, power off the DMT and wait approximately 30 seconds then turn DMT back on.

12.8.3. Wait for the DMT to warm back up (approximately five (5) minutes) without pressing any additional buttons or initiating a test.

12.8.4. Verify connection is restored by observing a  symbol in the lower right hand corner of screen.

12.9. **Calibration Check Error**: The quartz disc reading is outside the acceptance criteria.

12.9.1. Remove possible contamination sources from the processing area (e.g. hand sanitizer, cleaning reagents, alcohol prep pads, etc.).

12.9.2. Purge the sample chamber for approximately five (5) minutes.

12.9.3. Perform a Diagnostic test.

12.10. **Detector Overflow**: The detector is out of range or a subject's BrAC is greater than 0.600.

12.10.1. Ensure the breath tube is free from obstruction, including removing the mouthpiece.

12.10.2. Purge the sample chamber for approximately five (5) minutes.

12.10.3. If the error remains, turn off the DMT, open the top of the DMT using the security screwdriver, and ensure there are no obvious visible obstructions in the detector block. Do not poke around or move any parts.

12.11. **Display is not responsive**: The instrument is not responding to either the keyboard or the touch screen.

12.11.1. Power off the DMT and wait approximately 30 seconds then turn DMT back on.

12.12. **Filter X Won't Zero**: One (1) of the filters is not reading properly.

12.12.1. Remove possible contamination sources from the processing area (e.g. hand sanitizer, cleaning reagents, alcohol prep pads, etc.).

12.12.2. Purge the sample chamber for approximately five (5) minutes.

12.12.3. Perform a Diagnostic test.

12.13. **Filter Wheel Error**: The filter wheel is not activating or locking into position properly.

12.13.1. Perform a Diagnostic test.

12.13.2. If the error remains, open the top of the DMT using the security screwdriver.

12.13.3. Close the lid and initiate a Diagnostic test. Once started, open the lid and watch the filter wheel while the Diagnostic is running.

12.13.4. Note any observations (i.e. filter wheel never starts spinning, the metal pin does not secure into the slot in the filter wheel, there is an abnormal grinding sound, etc.).

12.14. **Interference (simulator solution)**: The ratio between the measurements at the three (3) filters is not what is expected for ethanol.

12.14.1. Try the test again.

12.14.2. Remove possible contamination sources from the processing area (e.g. hand sanitizer, cleaning reagents, alcohol prep pads, etc.).

12.14.3. Purge the sample chamber for approximately five (5) minutes.

12.14.4. If the error persists, perform an SSC or RPC.

12.15. **Interference (subject sample)**: The ratio between the measurements at the three (3) filters is not what is expected for ethanol.

12.15.1. Allow the subject provide a second sample.

12.15.2. If the second sample also reports INTERFERENCE, you may proceed as a DUI – Blood case and request a blood sample.

12.15.3. If the error is reoccurring, remove possible contamination sources from the processing area (e.g. hand sanitizer, cleaning reagents, alcohol prep pads, etc.).

12.15.4. Purge the sample chamber for approximately five (5) minutes then perform a Check-In test and provide an alcohol free sample using the subject name, “Test Test” to ensure the problem is rectified.

12.16. **Invalid**: Subject breath profile did not meet the sample acceptance criteria.

12.16.1. Ensure the mouth is free from foreign objects then restart the 15 minute observation period.

12.16.2. Instruct the subject again in the proper technique for providing a sample.

12.16.3. Allow the subject to provide another sample.

12.16.4. If the error is reoccurring, remove possible contamination sources from the processing area (e.g. hand sanitizer, cleaning reagents, alcohol prep pads, etc.).

12.16.5. Purge the sample chamber for approximately five (5) minutes then perform a Check-In test and provide an alcohol free sample using the subject name, “Test Test” to ensure the problem is rectified.

12.17. **Keyboard does not function**

12.17.1. Reseat the keyboard cord in the USB port at the back of the instrument.

12.17.2. Plug the keyboard into a different USB port.

12.17.3. If the connection is not restored, power off the DMT and wait approximately 30 seconds then turn DMT back on.

12.17.4. If available, try a different USB keyboard**.**

12.18. **Printer Error**: The instrument is unable to communicate with the printer.

12.18.1. Follow these steps in this **EXACT ORDER.**

12.18.2. Ensure the printer is plugged in to the wall and the cord connections between the DMT and printer are secure.

12.18.3. Verify the printer is ready (i.e. paper and ink supply are good and there are no error lights present).

12.18.4. Power off the DMT using the switch on the back and wait approximately 30 seconds. Turn the DMT back on.

12.18.5. A message will pop up looking for a USB driver. Click the "x" in the top right corner or ignore this message. DO NOT enter anything into this box.

12.18.6. Once the DMT is back online, press copy to verify printer function. This will print a copy of the most recent DMT test ticket.

12.19. **Pump Error**: Air flow through the DMT is restricted.

12.19.1. This error most commonly occurs when a mouth piece is put on too early or left on after a breath test.

12.19.2. Verify there is not a mouthpiece in the breath tube and visually check the end of the breath tube to ensure there are no obstructions.

12.19.3. If the error remains, open the top of the DMT using the security screwdriver.

12.19.4. Ensure all tubing is properly connected and free from kinks.

12.19.5. Ensure the plunger on the five-way valve is moving freely.

12.19.6. Power off the DMT and wait approximately 30 seconds then turn DMT back on.

12.19.7. Perform a Diagnostic test.

12.20. **RF Detected**: Radio frequency was detected during the testing sequence.

12.20.1. Ensure any radio transmitters in and around the processing area are turned off and try the test again.

12.21. **Simulator displays "Status Code: X (1-9)**: The simulator is in error.

12.21.1. Take a picture or record the exact message displayed on the simulator.

12.21.2. Toggle the simulator power using the switch on top of the simulator.

12.21.3. If the error message persists, **immediately power off the simulator** and contact the VFL Toxicology Section.

12.22. **Simulator Out of Range**: The simulator vapor concentration is not within 5% of the target.

12.22.1. If the result is 0.000:

12.22.1.1. Ensure the simulator is connected to the DMT.

12.22.1.2. Open the lid of the DMT using the security screwdriver and verify the 5-way valve is not stuck.

12.22.2. If the result is low due to solution depletion:

12.22.2.1. Try the test again

12.22.2.2. Perform an SSC or RPC.

12.22.3. Ensure the simulator jar is properly threaded to the simulator head.

12.22.4. Inspect the simulator gasket and jar for damage.

12.22.5. Open the instrument cover and ensure the tubing is properly connected and not kinked.

12.22.6. Perform an Accuracy and Precision check to assess the simulator vapor concentration.

12.23. **Simulator Temp Unknown**: The simulator temperature is not being read correctly by the DMT.

12.23.1. Check the simulator temperature by accessing the technician screen.

12.23.2. Ensure the simulator is turned on.

12.23.3. Ensure the cord connecting the DMT and the simulator is connected and secure.

12.23.4. Toggle simulator power using the switch on top of the simulator.

12.23.5. If the connection is not restored, power off the DMT and wait approximately 30 seconds then turn DMT back on.

12.23.6. Verify that the simulator does not display an error message. If the simulator temperature goes out of range, an error message may be displayed. Make a note of what the error message specifically says.

12.24. **Simulator Time Out**: The alcohol profile took too long to reach plateau while running a simulator vapor test.

12.24.1. Ensure the simulator is properly connected to the DMT and the simulator jar is properly threaded onto the simulator head.

12.24.2. Open the lid of the DMT using the security screwdriver and verify the 5-way valve is not stuck.

12.24.3. Access the technician screen and check the detector voltage. The detector voltage should NOT shift by more than 0.003V. Note: it is normal for the detector voltage to drift slightly or fluctuate a small amount.

12.25. **Standard Deviation Out of Range**: During an Accuracy and Precision check, the standard deviation result is greater than 0.0020.

12.25.1. Ensure the simulator is turned on.

12.25.2. Ensure the simulator is properly connected to the DMT and the simulator jar is properly threaded onto the simulator head.

12.25.3. Open the lid of the DMT using the security screwdriver and verify the 5-way valve is not stuck.

12.25.4. Access the technician screen and check the detector voltage. The detector voltage should NOT shift by more than 0.003V. Note: it is normal for the detector voltage to drift slightly or fluctuate a small amount.

13. Abbreviations

13.1. UPS: Uninterruptable Power Supply

13.2. RPC: Routine Performance Check

13.3. SSC: Simulator Solution Change

13.4. A&P: Accuracy and Precision

13.5. RF: Radio frequency

14. References

14.1. TOX_P200_DMT Manual

14.2. DMT Maintenance Log

15. Appendices

15.1. Appendix A: Example DMT Reports

15.2. Appendix B: DMT Quick Troubleshooting Guide

Appendix A

SOLUTION CHANGE

DataMaster DMT: 121706
Location: VFL
Date: 01/03/2020
Performed by: SARAH STRATTON

Accuracy and Precision Check

Concentration	= 0.100 g/210L
Lot #	= TEST
Range	= 0.095 - 0.105
Average	= 0.095 g/210L
Std Dev	= 0.0004

Simulator Temperature: 34.0°C

Performed by SDS **Date** 01/03/2020

ROUTINE PERFORMANCE CHECK REPORT

DataMaster DMT: 121706
Location: VFL
Calibration Date: 08/30/2019
Certification Date: 08/30/2019
Installation Date: 11/06/2019
RPC Date: 01/02/2020
Supervisor Name: SARAH STRATTON

Diagnostic Results

```
VERSIONS
DMT: 2.06
PIC: 2.08
Modem: 2.6
Questions: 2.1

TEMPERATURES

Sample Chamber = 49.0°C
Breath Tube    = 45.6°C
Digital Sim    = 34.0°C

SETTINGS
Lamp Voltage   = 1.74 V
Cooler Voltage = 1.74 V
Bias Voltage   = 80 V
Chopper Freq   = 529 Hz

PUMP INFO
Flow Rate = 5.234 L/M

DETECTOR INFO
PUMP     ON         OFF
MAX(V)   -0.0693    -0.0661
MIN(V)   -0.0713    -0.0681

FILTER INFO
Filter 1  -0.068  Zero = true
Filter 2   0.596  Zero = true
Filter 3   0.253  Zero = true

CALIBRATION CHECK
Xq  = 0.075  1.98%
```

Routine Performance Check Passed

Accuracy and Precision Check

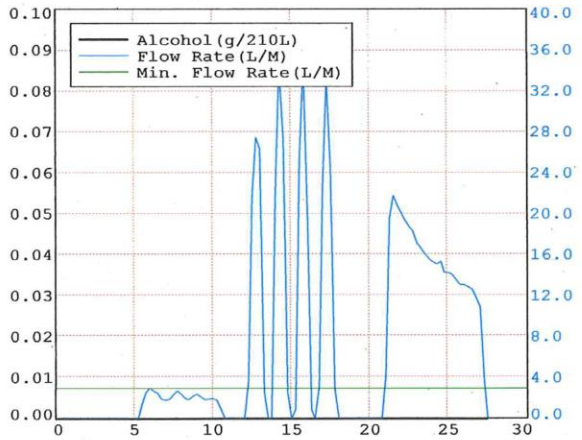
Concentration	= 0.100 g/210L
Lot #	= TEST
Range	= 0.095 - 0.105
Average	= 0.095 g/210L
Std Dev	= 0.0004

RF Detection Test

Passed
RF detected

Sample Acceptance Test

Passed



Performed by SJS **Date** 01/02/2020

Reviewed by _____ **Date** _____

DIAGNOSTIC RESULT

DataMaster DMT: 121706
Location:
Calibration Date: 01/30/2020
Certification Date: 02/06/2020
Installation Date:
Test Date: 02/15/2020
Test Time: 10:00:02

```
VERSIONS
DMT: 2.06
PIC: 2.08
Modem: 2.6
Questions: 2.1

TEMPERATURES

Sample Chamber = 48.6°C
Breath Tube    = 46.8°C
Digital Sim    = 34.0°C

SETTINGS
Lamp Voltage   = 1.74 V
Cooler Voltage = 1.74 V
Bias Voltage   = 80 V
Chopper Freq   = 530 Hz

PUMP INFO
Flow Rate = 5.311 L/M

DETECTOR INFO
PUMP     ON         OFF
MAX(V)    0.0384     0.0419
MIN(V)    0.0362     0.0394

FILTER INFO
Filter 1   0.040  Zero = true
Filter 2   0.691  Zero = true
Filter 3   0.350  Zero = true

CALIBRATION CHECK
Xq  = 0.074  1.14%
```

ACCURACY & PRECISION REPORT

STATE OF VERMONT

DataMaster DMT: 121706
Location: VFL

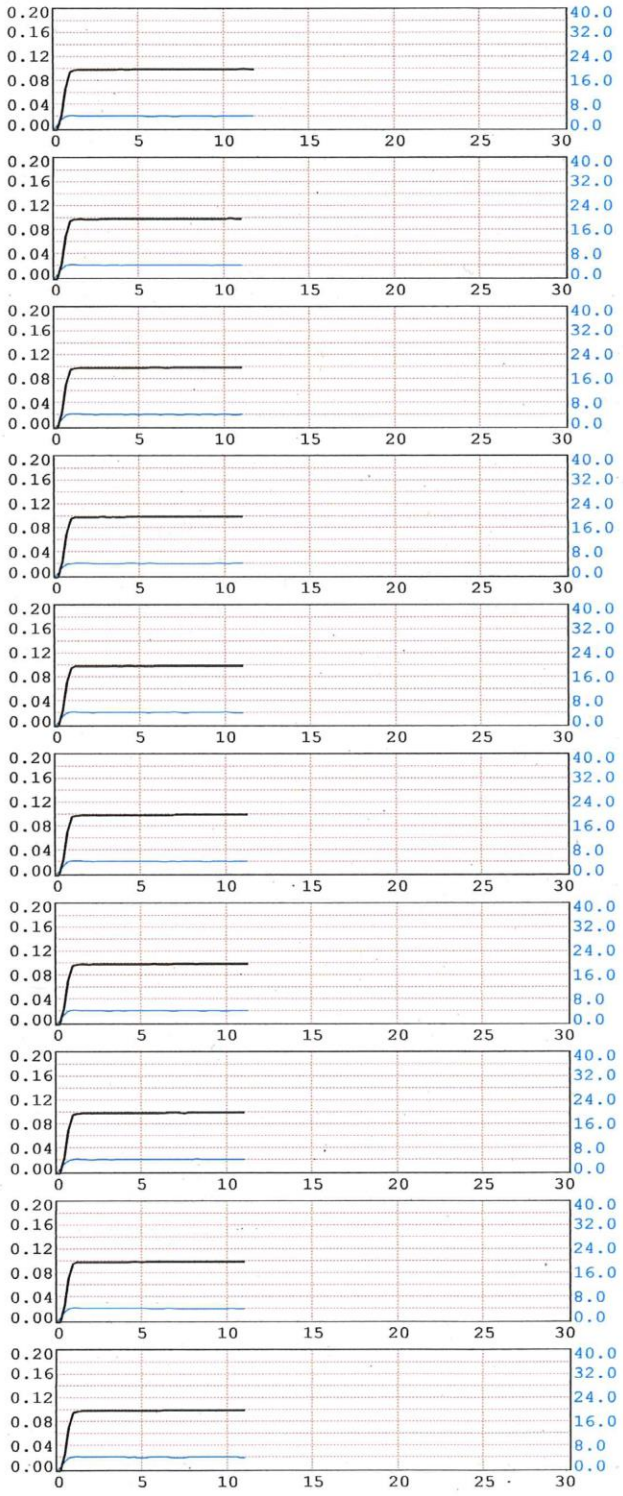
Date: 01/13/2020
Time: 15:20:39

SUPERVISOR NAME:
SARAH STRATTON

SOLUTION LOT #: TEST
SOLUTION CONCENTRATION: 0.100

BLANK TEST	0.000	15:21
CALIBRATION CHECK	PASSED	15:21
SIMULATOR VAPOR 34.0°C	0.100	15:21
SIMULATOR VAPOR 34.0°C	0.099	15:22
SIMULATOR VAPOR 34.0°C	0.099	15:24
SIMULATOR VAPOR 34.0°C	0.100	15:25
SIMULATOR VAPOR 34.0°C	0.100	15:26
SIMULATOR VAPOR 34.0°C	0.099	15:27
SIMULATOR VAPOR 34.0°C	0.099	15:28
SIMULATOR VAPOR 34.0°C	0.099	15:29
SIMULATOR VAPOR 34.0°C	0.099	15:30
SIMULATOR VAPOR 34.0°C	0.099	15:31
BLANK TEST	0.000	15:32

Average = 0.099
Std Dev = 0.0004



Appendix B

DMT Quick Troubleshooting Guide

Blank Error or Ambient Fail — The DMT is detecting apparent alcohol in the room air

- Remove mouthpiece from DMT and move the subject away from the DMT and draw fresh air into the room by opening a door or turning on a fan
- Ensure there are no external sources of alcohol in the processing room (e.g. hand sanitizer, cleaning reagents, alcohol prep pads, etc)

BUSY - Please Wait — DMT froze while attempting to upload records to the server

- Allow ~ 1 minute for this message to go away. Do not push any buttons or attempt to run tests on the DMT when this message is displayed.
- If the error persists for longer than 1 minute, power off the DMT using the switch on the back and wait ~30 seconds. Turn the DMT back on. Wait the required ~5 minutes for the DMT to boot up without pushing any buttons or initiating a test
- Verifiy connection is restored by observing a symbol in the lower right hand corner of screen

Incomplete — The subject did not provide an adequate sample in the allotted time

- Instruct the subject in the proper technique (deep breath, create tight seal with their lips, and continue to blow a long, continuous breath)
- Allow subject to try the test again. There are three 2-minute windows to provide a sample followed by QC checks and then three additional 2-minute windows
- INCAPABLE - Subject physically *cannot* provide an adequate sample. You may request a blood sample
- REFUSAL - Subject *will not* provide an adequate sample. Based on *your* experience, you may deem this a refusal and proceed as such

Interference — There may be something other than ethanol in the sample

- You DO NOT need to observe another 15 minute observation period
- Allow subject to provide another sample.
- If you get INTERFERENCE again, you may request a blood sample

Invalid — Subject breath profile did not meet sample acceptance criteria

- Restart the 15 minute observation period. Ensure the mouth is free from foreign objects.
- Instruct the subject in the proper technique for providing a sample (deep breath, create tight seal with their lips, and continue to blow a steady, conintuous breath)
- Allow subject to provide another sample
- NOTE: Huffing and puffing may cause invalid sample results. Ensure subject provides proper breath sample

Printer Error — The connection between the DMT and printer has been broken

- *IN THIS ORDER:*
- Ensure the printer is plugged in to the wall and the cord connections between the DMT and printer are secure
- Verify the printer is ready (i.e. paper and ink supply are good and there are no error lights present)
- Power off the DMT using the switch on the back and wait ~30 seconds. Turn the DMT back on
- A message will pop up looking for a USB driver. Click the "x" in the top right corner or ignore this message. DO NOT enter anything into this box
- Once the DMT is back online, press copy to verify printer function. This will print a copy of the most recent DMT test ticket

Pump Error — Air flow through the DMT is restricted

- Most commonly occurs when a mouth piece is put on too early or left on after a breath test
- Verify there is not a mouthpiece in the breath tube and visually check the end of the breath tube to ensure there are no obstructions

RF Detected — Radiofrequency was detected during the testing sequence

- Ensure any radio transmitters in and around the processing area are turned off and try test again

Simulator Out of Range — The simulator vapor concentration is not within 5% of the target

- Move the subject away from the DMT and try the test again
- If the simulator vapor is still out of range, move on to another agency

Simulator Temp Unknown — Simulator temperature is not being read by the DMT correctly

- Ensure the the cord connecting the DMT and the simulator is connected and secure
- Power off the simulator using the switch on top of the simulator and turn it back on
- Power off the DMT using the switch on the back and wait ~30 seconds. Turn the DMT back on. If connection is not restored, go to another agency.

Please notify your DMT supervisor regarding any errors obtained. Be as detailed as possible when relaying information

Primary DMT Supervisor: _____

DOCUMENT HISTORY			
DATE	**VERSION**	**APPROVED BY**	**ACTIVITY OR REVISION**
08/26/2015	1	Lab Director	Updated to new format; minor changes made throughout document
07/18/2017	2	Lab Director	Removed "DataMaster" from instrument name; updated to reflect latest generation of simulator; minor changes made throughout
07/13/2020	3	Lab Director	Updated to outline format to align with other toxicology section manuals, renamed from ALC_D200_1 to TOX_D200_1, updated multiple sections to align with DMT software update including sample acceptance criteria and RF detection during RPC, updated multiple figures throughout document, updated example DMT tickets, expanded common error messages and responses including troubleshooting guide, formatting changes throughout document