

 <p>Iowa DCI Crime Laboratory Official Document</p>	<b>Title:</b> Certification or Re-certification of the DataMaster DMT	
	<b>Document ID:</b> SOP BAC-14	<b>Revision #:</b> 7
	<b>Effective Date:</b> 12-26-16	<b>Applies To:</b> Breath Alcohol
	<b>Reason for Revision/Sections Revised:</b> 4.4.1.1, 4.4.8 and 6.0	

**PURPOSE:** State law requires that the Division of Criminal Investigation Criminalistics Laboratory certify each instrument on a yearly basis. (Re)-Certification is necessary to insure the continued proper operation, accuracy and precision of the DataMaster DMT.

**DEFINITIONS:** “**Margin of Error**” – A measure, quantity or degree of difference between an observed value and the true value of a quantity, also known as, instrument bias.

## 1.0 SUMMARY

The Iowa Department of Public Safety, Division of Criminal Investigation, Criminalistics Laboratory is responsible for the certification of any evidential breath-testing instrument used within the state of Iowa. One such instrument approved for use within the state is the DataMaster DMT manufactured by National Patent Analytical Systems, Inc. (see 157-7.2(3)). All devices so used must be certified to be in proper working order within a period of one year immediately preceding use. (see 157-7.1(1))

## 2.0 REAGENTS APPARATUS and EQUIPMENT

- 2.1 Ethanol solutions (refer to SOP BAC-09)
- 2.2 Dry gas ethanol tank
- 2.3 Alcohol simulators (Guth 10-4D or equivalent)
- 2.4 Assortment of tools including, but not limited to: screwdrivers, pliers, wrenches, barometer, etc.
- 2.5 Spare parts for the DataMaster DMT
- 2.6 DataMaster DMT

## 3.0 SAFETY CONSIDERATIONS

- 3.1 Exercise normal safety precautions when working with electricity and the possibility of electrical shock.

## 4.0 PROCEDURE

- 4.1 Certification of the instrument is valid for a period of one year or until the date of the instruments next certification, whichever comes first.
- 4.2 Re-certification of an instrument may be performed either on-site or at the Division of Criminal Investigation Criminalistics Laboratory.
  - 4.2.1 During re-certification procedure, access to the instrument shall be limited to DCI personnel and law enforcement officers.
- 4.3 If the instrument is inoperable, necessary maintenance may be performed prior to re-certification procedure.
- 4.4 Minimum requirements for re-certification include:
  - 4.4.1 A diagnostic test indicating that the instrument is within specifications established by the manufacture.
    - 4.4.1.1 The barometer on the DataMaster DMT can be verified using a reference barometer (Manometers).
      - 4.4.1.1.1 The barometer on the DMT can be set, at the analysts' discretion, using a reference barometer (Manometers) as a station pressure at an altitude equal to zero, or by inputting the altitude at the location and using the barometric pressure.
    - 4.4.2 Verification of "as found" condition – One ethanol solution in a wet bath simulator will be measured a minimum of three times. The solution used for this verification will not be used in the calibration of the same instrument.
    - 4.4.3 Adjustment (if necessary) – If the "as found" verification results are outside 0.004 g/210 L or 5%, whichever is greater, of the expected ethanol concentration, an adjustment will be performed. If the results are within the acceptable margins, an adjustment may still be performed at the analyst's discretion. The solution used for the adjustment will not be used for the calibration, or verification of calibration, on the same instrument.
    - 4.4.4 Calibration, or linearity check - A minimum of a three (3) ethanol solutions with concentrations between 0.010 and 0.400 g/210 L ran a minimum of three times per concentration. The correlation coefficient ( $R^2$ ) of the calibration, or linearity check, must be a minimum of 0.995.
    - 4.4.5 Verification of calibration – One dry gas ethanol tank will be measured a minimum of three times. The results must fall within 0.004 g/210 L of the target ethanol concentration. The dry gas

ethanol tank used for this verification will not be used for the calibration, or adjustment, of the same instrument.

- 4.4.6 Radio Frequency Interference test - Using an officer's radio or a portable handheld two-way radio, check that the RFI setting is acceptable. If no RFI is obtained, reset the RFI sensitivity and retest.
- 4.4.7 Interference Check – Perform an interference check with a wet bath solution of a known ethanol concentration, containing approximately 200 microliters of acetone or isopropyl alcohol, or approximately 100 microliters of a combination of both. Results of the test shall indicate “Interference Detected”.
- 4.4.8 Zero Breath Test – The analyst shall perform a breath test entering fictitious information (simulated data similar to the real data an officer would enter) into the DataMaster. The test must show that a zero alcohol reading was obtained, the minimum breath volume was capable of being met, and that the DataMaster printout is showing all relevant information (results, graph, typed in information, etc.).
- 4.4.9 A diagnostic test at the end of the re-certification, indicating that the instrument is within specifications established by the manufacture.

4.5 Additional maintenance may be necessary to ensure that the instrument is in proper working order. Examples of these may include:

- 4.5.1 Replacement of parts
- 4.5.2 Setting of voltages
- 4.5.3 Analysis of additional ethanol solutions of different alcohol concentrations

4.6 The Official Certification Report shall be generated within the LIMS maintained by the laboratory. The original will be kept within the DCI Laboratory. Copies of the Official Certification Report shall be accessible to County Attorneys and the Department of Transportation via the LIMS and/or on the DCI Website.

## 5.0 QUALITY CONTROL

- 5.1 Ethanol solutions must be prepared fresh after fourteen (14) days of use or earlier.
- 5.2 Prepared ethanol solutions shall be documented on the “Ethanol Solution Preparation Log” (see form DCIL BAC-04) which contains:
  - 5.2.1 Date the solution was prepared
  - 5.2.2 Solution number
  - 5.2.3 Concentration of the solution

- 5.2.4 Control or Lot numbers of the purchased ethanol standard used to make the solution
- 5.2.5 Bottle number of the ethanol standard
- 5.2.6 Initials of the analyst who prepared the solution
  
- 5.3 Purchased ethanol standards are typically accompanied by a “Certificate of Analysis” supplied by the manufacturer. The Division of Criminal Investigation – Breath Alcohol Section shall retain these certificates.
  - 5.3.1 The certificate of analysis shall be scanned into the LIMS.
  
- 5.4 The margin of error of the instrument will be determined at the time of certification.
  - 5.4.1 These calculations may be done by the analyst or the DataMaster DMT.
  - 5.4.2 For alcohol concentrations 0.080 g/210L and lower, subtract the average of the results from the expected alcohol concentration.
  - 5.4.3 For alcohol concentrations 0.081 g/210L and greater, take the average of the results and subtract this from the expected concentration, then divide this value by the expected concentration and then multiply by 100.
  - 5.4.4 Determine this for each level of standard tested.
  - 5.4.5 The margin of error shall be no greater than +/- 0.004 or 5% whichever is greater.
  
- 5.5 Appropriate data generated by the DataMaster DMT is to be saved and kept in a file located at the Division of Criminal Investigation Crime Laboratory – Breath Alcohol Section, along with the certification/re-certification report for that particular instrument. This data may include, but is not limited to:
  - 5.5.1 A completed DMT Certification check sheet DCIL BAC-01
  - 5.5.2 Data generated from Section 4.4
  - 5.5.3 Any other information collected by the analyst examining the instrument used to make a determination that the instrument is in proper working order
  
- 5.6 The printouts generated by the DataMaster shall be scanned into the appropriate instrument file within the LIMS system currently in use at the DCI Laboratory.
  
- 5.7 The maintenance record shall be updated within the LIMS to include the date the instrument was (re)certified and any maintenance, repairs and testing done to the instrument (refer to SOP BAC-03).

5.8 Input the results of the ethanol solutions from the recertification into the excel program following the procedure set forth in SOP BAC-03.

## 6.0 COMMENTS

Re-certification of the DataMaster DMT may occur more frequently than a period of once a year.

Values of the ethanol standards used during verifications, adjustments, and calibrations of the DataMaster DMT will be the values determined in Section 5.4 of SOP BAC-09.

## 7.0 REFERENCES

7.1 Iowa Administrative code Chapter 661-157