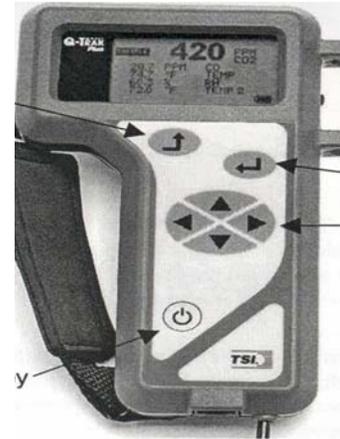


The only official copy is on-line at the SHSD IH Group website.
Before using a printed copy, verify that it is current by checking the document issue date on the website.

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division	NUMBER IH97260
	REVISION FINAL Rev0
INDUSTRIAL HYGIENE GROUP Standard Operating Procedure: Field Procedure	DATE 10/06/04
SUBJECT: INSTRUMENT OPERATION	PAGE 1 OF 12
Q-Trak[®] Plus IAQ Monitor	

Contents

- 1.0 Purpose/Scope**
- 2.0 Responsibilities**
- 3.0 Definitions**
- 4.0 Prerequisites**
- 5.0 Precautions**
- 6.0 Procedure**
- 7.0 Implementation and Training**
- 8.0 References**
- 9.0 Attachments**
- 10.0 Documentation**



1.0 Purpose/Scope

The purpose of this document is to provide a simple field procedure for operating the Q-Trak[®] Plus Indoor Air Quality monitor. With this document the user will be able to use the machine to capture building environmental data and download all data collected for analysis. The procedure for operating the Q-Trak[®] Plus IAQ monitor is based on the information provided in the operator guide.

Indoor Air Quality can positively or negatively affect worker performance. The environmental quality in the work area should be kept as healthy as possible to maximize worker comfort and productivity and to eliminate the need for personal protective equipment. This meter can measure certain parameters of an indoor air quality profile including temperature, relative humidity, carbon dioxide and carbon monoxide levels. These parameters can be indicators of poor indoor quality and point to the need for further investigations into the source of contamination, building HV AC problems or overcrowding of the work area.

2.0 Responsibilities

- 2.1 This procedure will be implemented through the SHSD Industrial Hygiene Group Leader. The IH Group Leader may assign the duties to an *IAQ Program Administrator*. Members of the SHSD Industrial Hygiene Group, the Radiation Control Division Facility Support Group, and Plant Engineering can qualify to perform tasks in this

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division	NUMBER IH97260
	REVISION FINAL Rev0
INDUSTRIAL HYGIENE GROUP Standard Operating Procedure: Field Procedure	DATE 10/06/04
	PAGE 2 OF 12
	SUBJECT: INSTRUMENT OPERATION
Q-Trak[®] Plus IAQ Monitor	

program based on their approval by the line management for the person conducting the measurement. Personnel who have demonstrated competency in performing tasks, in accordance with this procedure, will be qualified to serve as Qualified Sampler. Qualification is documented in Attachment 9.4.

- 2.2 Data Quality Control procedures: The Qualified Sampler is responsible for the integrity of the data until properly transferred to the IH Group laboratory using the SHSD established procedures. To have the data included in the SHSD IH group databases, approval of the data by the IH Group Leader or designee is required. Approval will be contingent on: documentation that indicates appropriate sampling procedures were followed including calibration checks before, during and after the work; submittal of an appropriate data form; and any other requested documentation to the IH group.
- 2.3 Hazard Analysis of the Sampling Task: It is the responsibility of the Qualified Sampler and his/her supervisor to ensure that training is current and the appropriate personal protective equipment is worn. In addition, the person performing this procedure and his/her supervisor are responsible to ensure that all required training and qualification for other hazards that may be present in areas (such as respiratory protection or radiation contamination) have been met. The Qualified Sampler and their line supervisor are responsible to comply with all work planning and work permit system requirements.
- 2.4 The Qualified Sampler is required to request and check the instrument in and out of the IH lab in accordance with the SOP's IH 51200 & 51500.

3.0 Definitions:

IAQ profile: A description of the features of the building structure, function and occupancy that impacts indoor air quality.

Program Administrator: A person designated by the IH Group Leader or SHSD management to administer this procedure and the associated program of IAQ data management.

Qualified Sampler: A person who has demonstrated competency in accordance with Section 7 to perform this field procedures and is approved to independently use the Q-

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division	NUMBER IH97260
	REVISION FINAL Rev0
INDUSTRIAL HYGIENE GROUP Standard Operating Procedure: Field Procedure	DATE 10/06/04
	PAGE 3 OF 12
SUBJECT: INSTRUMENT OPERATION	
Q-Trak[®] Plus IAQ Monitor	

Trak[®] Plus and interpret results.

4.0 Prerequisites

Training: For SHSD personnel, the SHSD Industrial Hygiene Group Leader, Program Administrator or their designee, will qualify personnel in the use and interpretation of results from the Q-Trak[®] Plus using Attachment 9.4.

5.0 Precautions

5.1 Hazard Determination:

- 5.1.1 This test may be done in areas where chemicals contamination may be present. These contaminants can have significant health effects and must receive a hazard evaluation by a cognizant ESH professional. This monitor does not generate a hazard to the operator or occupants.
- 5.1.2 Air testing using this procedure does not generate Hazardous Wastes or have negative environmental consequences.
- 5.1.3 The test equipment design does not cause significant ergonomic concerns in routine use. The meter does not have a noise hazard.

5.2 Personal Protective Equipment

- 5.2.1 Typically, this meter is primarily used for measuring comfort factors in office spaces where there is no risk to the sampler from hazardous levels of chemical or radiological contamination. Personal Protective Equipment is typically not needed in this scenario.
- 5.2.2 For work done where there is a potential for chemical or radiological hazards to be present, a hazard assessment to determine the inherent hazardous conditions, evaluate the degree of hazard to individuals and put in place appropriate protective measures based on the hierarchy of controls is to be done by a cognizant ESH professional.

6.0 Procedure

- 6.1 Equipment: (see Attachment 9.1 and 9.2)

The only official copy is on-line at the SHSD IH Group website.
 Before using a printed copy, verify that it is current by checking the document issue date on the website.

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division INDUSTRIAL HYGIENE GROUP Standard Operating Procedure: Field Procedure	NUMBER IH97260
	REVISION FINAL Rev0
SUBJECT: INSTRUMENT OPERATION Q-Trak[®] Plus IAQ Monitor	DATE 10/06/04
	PAGE 4 OF 12

- Q-Trak[®] Plus IAQ Monitor With extension wand.
- A/C adapter for continuous monitoring more than 8 hours.
- Data cable for RS232 connection to the IH equipment computer and direct printer connection.
- Calibration gases, regulator, tubing and probe sleeve.

6.2 Keys and Symbols

<i>On/Off</i> key	
<i>Enter</i> key	
<i>Return</i> key (returns user to main menu)	
<i>up/down</i> arrow keys and <i>left/right</i> arrow keys	

6.2 **Turn on the unit:** Press the *On/Off* key. Once the unit is through the start up procedure it is in the Survey Mode.

6.3 **Calibration of the equipment** It is not necessary to calibrate the unit prior to each use. However, as a check, observe the CO₂ readings: it should typically be around 350 parts per million in ambient “clean air”. The manufacturer recommends in-house calibration of the instrument for CO and CO₂ monthly. It is recommended that the unit be bump checked for carbon dioxide and carbon monoxide before and after each use. Calibration of the unit will be conducted by the IH lab technician, typically prior to each use of the meter for long term monitoring. Although the concentrations of calibration gas are not hazardous, calibrations should be conducted inside a chemical fume hood.

6.3.1 Carbon Dioxide (CO₂) Sensor Calibration: Both zero CO₂ air and a span gas concentration are needed for the calibration.

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division	NUMBER IH97260
	REVISION FINAL Rev0
INDUSTRIAL HYGIENE GROUP Standard Operating Procedure: Field Procedure	DATE 10/06/04
SUBJECT: INSTRUMENT OPERATION	PAGE 5 OF 12
Q-Trak[®] Plus IAQ Monitor	

- Select **Calibration** from the main menu.
- Select **CO₂** and press the **enter** key.
- Cover the probe with the calibration collar and ensure a tight fit.
- Install the regulator on the zero calibration gas and connect tubing to the fitting marked Gas In.
- Press the **enter** key and turn on the gas (0.3 LPM).
- Press the **enter** key again to begin zero gas calibration. After averaging the zero gas the display shows “Zero Cal Complete”.
- Turn off the gas. Press the **enter** key again.
- Attach the regulator to the span gas and press the **enter** key.
- Adjust the span gas concentration using the **up/down arrow** keys.
- Press the **enter** key to accept.
- Turn on the span gas and press the **enter** key to begin calibrating. When complete the display reads “Span Cal Complete”.
- Turn off the gas, press the **enter** key and remove the calibration collar.

6.3.2 Carbon Monoxide (CO) sensor calibration: Repeat all steps in 6.3.1 with a cylinder containing Carbon Monoxide. Note: 100% nitrogen is not to be used as zero CO air.

6.3.3 Temperature and Relative Humidity Sensor Calibration: This operation is conducted using reference devices and is not covered in this SOP.

6.4 **Operation of the meter (Survey Mode)**: The monitor displays all four measurement parameters simultaneously.

The temperature may be changed from °F to °C by using the **up/down** arrow keys to select the TEMP and then the **left/right** arrow keys to change the units.



General navigation in the meter set-up: When in the **survey mode**, press the **Return** key to select the main menu. Use the **up/down arrow** keys to move through the menu and the **enter** key to select a menu item.

Select the **Setup Menu** to: change the date/time; clear the memory; calibrate the instrument; or print. Either the single point or logged test memory may be selected for clearing.

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division	NUMBER IH97260
	REVISION FINAL Rev0
INDUSTRIAL HYGIENE GROUP Standard Operating Procedure: Field Procedure	DATE 10/06/04
SUBJECT: INSTRUMENT OPERATION	PAGE 6 OF 12
Q-Trak[®] Plus IAQ Monitor	

Use the **Return** key to deselect an item and move back through the menu.

Ventilation rates may be calculated using CO2 concentrations or temperature in the outside air, supply air, and return air. Follow the prompts using the **arrow keys** to move from one reading to the next and input numbers by using the **up/down arrow** keys.

- 6.5 **Logging Data:** The units displayed on the instrument will be the same units that are stored during logging. The sample mode is the default of the survey mode and is used to capture a single, 10-second averaged data point of all measured parameters.
- 6.5.1 **Clear Memory:** Download all data prior to performing the clear memory option. Select the **Clear Memory** option on the Setup menu. After pressing the **enter** key, the screen asks to select either single point or logged test data memory.
- 6.5.2 **Logging:** Pressing the **enter** key in the sample mode starts the sample collection (during this time, the meter shows a count down from 10 to 1). After 10 seconds, the meter will ask the operator to select *yes* or *no* to save that sample. Press the **enter** key again to save the sample or use the **right arrow** key to move to the *no* response before pressing the **enter** key.
- 6.5.3 **Changing log setting:** Highlight the Log Mode in the main menu. The default is Log Mode 1. Other functions may be set for Log modes 2 & 3 using the programming software. The Log Interval will be shown by pressing the **enter** key and selected by pressing the **enter** key again. Once log mode is selected the instrument will show Log Mode on the display and the test number. Press the **enter** key to stop the log mode and return to survey/sample mode. Selecting the log mode again will begin a new test.
- 6.6 **Keypad Lockout Switch:** During extended and/or unattended sampling periods, the keypad may be locked out using the switch on the side of the instrument. This prevents inadvertent interruptions to the measurements or intentional tampering. To stop monitoring, it is necessary to unlock the keypad switch.
- 6.7 **Print Data:** The instrument must be connected to a computer with the *Q-Trak Monitor* software installed. Connect the RS-232 cable to the serial port on the computer. Connect the RJ45 connector end to the *Q-Trak monitor* communications port.
- 6.7.1 Turn on the monitor and start the **Trak Pro** software.
- 6.7.2 Select *FindPort* to search for the monitor and *OK* to accept the setup.

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division	NUMBER IH97260
	REVISION FINAL Rev0
INDUSTRIAL HYGIENE GROUP Standard Operating Procedure: Field Procedure	DATE 10/06/04
	PAGE 7 OF 12
SUBJECT: INSTRUMENT OPERATION	
Q-Trak[®] Plus IAQ Monitor	

- 6.7.3 Turn the Q-Trak monitor and printer off. Connect the printer interface cable 9 pin adapter to the printer and the other end to the Q-Trak monitor.
- 6.7.4 Turn on the Q-Trak Plus monitor before turning on the printer.
- 6.7.5 Follow the software commands.

6.8 **Turn off the unit:** Press the *on/off* button to turn the unit off. All data will be stored for later review and downloading.

7.0 Implementation and Training

- 7.1 Monitoring shall be performed only by persons who have demonstrated the competence to satisfactorily perform the tests as evidenced by experience and training. For SHSD personnel, the qualification to use this procedure, demonstration of competency, and qualification is documented using Attachment 9.3 *Job Performance Measure*.
- 7.2 Qualification Frequency & Recordkeeping: The supervisor of *Qualified Samplers* are responsible to ensure that the employees remain competent in the operation of this meter.
 - Personnel shall be re-qualified when there is evidence that they do not clearly understand the principles of operation of this meter.
 - The re-qualification frequency is 3 years. However, if a person has not used this instrument for a period of over 12 months from the date of last qualification, demonstration of competency to perform this procedure to the satisfaction of the supervisor may be required before sampling commences.
 - If significant and substantive changes to the procedure are made, *Qualified Samplers* will be notified of the changes.

8.0 References

- 8.1 TSI Incorporated Operation and Service Manuals Model 8552/8554 Q-Trak Plus IAQ Monitor.

9.0 Attachments

- 9.1 Photograph of meter

The only official copy is on-line at the SHSD IH Group website.
 Before using a printed copy, verify that it is current by checking the document issue date on the website.

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division INDUSTRIAL HYGIENE GROUP Standard Operating Procedure: Field Procedure	NUMBER IH97260
	REVISION FINAL Rev0
SUBJECT: INSTRUMENT OPERATION Q-Trak[®] Plus IAQ Monitor	DATE 10/06/04
	PAGE 8 OF 12

- 9.2 Photograph of Calibration Setup
- 9.3 *Short Operating Instructions*
- 9.4 *Job Performance Measure*

10.0 Documentation

Document Review Tracking Sheet		
PREPARED BY: J. Peters IH Field Supervisor Date 12/02/03	REVIEWED BY: R. Selvey IH Group Leader Date 10/06/04	APPROVED BY: R. Selvey IH Group Leader Date 10/06/04
Filing Code: IH97QR.04	DQAR Date	Effective Date: 10/06/04

Periodic Review Record		
Date of Review	Reviewer Signature and Date	Comments Attached

The only official copy is on-line at the SHSD IH Group website.
Before using a printed copy, verify that it is current by checking the document issue date on the website.

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division	NUMBER IH97260
	REVISION FINAL Rev0
INDUSTRIAL HYGIENE GROUP Standard Operating Procedure: Field Procedure	DATE 10/06/04
SUBJECT: INSTRUMENT OPERATION	PAGE 9 OF 12
Q-Trak[®] Plus IAQ Monitor	

Attachment 9.1

Photograph of Meter



Ref	Item Description
1	Q-TRAK Plus IAQ Monitor
2	CO2 Calibration Collar
3	CO Calibration Collar Accessory
4	Batteries (AA alkaline)
5	Computer Interface Cable (RS-232)
6	AC Adapter 115 V, NEMA-5

The only official copy is on-line at the SHSD IH Group website.
Before using a printed copy, verify that it is current by checking the document issue date on the website.

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division	NUMBER IH97260
	REVISION FINAL Rev0
INDUSTRIAL HYGIENE GROUP Standard Operating Procedure: Field Procedure	DATE 10/06/04
SUBJECT: INSTRUMENT OPERATION	PAGE 10 OF 12
Q-Trak[®] Plus IAQ Monitor	

Attachment 9.2

Photograph of Calibration Setup



The only official copy is on-line at the SHSD IH Group website.
 Before using a printed copy, verify that it is current by checking the document issue date on the website.

BROOKHAVEN NATIONAL LABORATORY Safety & Health Services Division INDUSTRIAL HYGIENE GROUP Standard Operating Procedure: Field Procedure	NUMBER IH97260
	REVISION FINAL Rev0
SUBJECT: INSTRUMENT OPERATION Q-Trak[®] Plus IAQ Monitor	DATE 10/06/04
	PAGE 11 OF 12

Attachment 9.3 Quick Operation Guide

Turn on the unit	Use the On/Off key to turn the unit on.
	Once the unit is through the start up procedure it is in the Survey Mode. It is usually not necessary to calibrate the unit prior to each use. However, as a check CO2 readings are typically around 350 parts per million in ambient air.
Survey Mode	The monitor displays all parameters simultaneously.
	The temperature may be changed from °F to °C by using the up/down arrow keys to select the TEMP and then the left/right arrow keys to change the units.
	The units displayed on the instrument will be the same units that are stored during the log mode.
	The sample mode is the default of the survey mode and is used to capture a single, 10-second averaged data point of all measured parameters.
	Pressing the enter key in the sample mode starts the sample collection and after 10 seconds will ask the operator to select yes or no to save that sample. Press the enter key again to save the sample or use the right arrow key to move to the no response before pressing the enter Key.
Main Menu	When in the survey mode, press the _____ key to select the main menu. Use the up/down arrow keys to move through the menu and the enter key to select a menu item.
	Select the setup menu to change the date/time, clear the memory calibrate the instrument or print.
	Either the single point or logged test memory may be selected for clearing.
	Use the _____ key to deselect an item and move back through the menu.
Log Mode	Ventilation rates may be calculated using CO2 concentrations or temperature in outside air, supply air and return air. Follow the prompts using the arrow keys to move from one reading to the next and input numbers by using the up/down arrow keys.
	Highlight the Log Mode in the main menu. The default is Log Mode 1. Other functions may be set for Log modes 2 & 3 using the programming software.
	The Log Interval will be shown by pressing the enter key and selected by pressing the enter key again.
	Once log mode is selected the instrument will show Log Mode on the display and the test number.
Memory/Battery Considerations	Press the enter key to stop the log mode and return to survey/sample mode.
	Selecting the log mode again will begin a new test.
Keypad Lockout Switch	For long term monitoring events (greater than 8 hours) the unit should be plugged into a wall outlet and log interval changed to 15 minutes.
	During extended and/or unattended sampling periods the keypad may be locked out using the switch on the side of the instrument. This prevent inadvertent interruptions to the measurements. To stop monitoring it is necessary to unlock the keypad switch.
Clear Memory	Download all data prior to performing the clear memory option. Select the Clear Memory option on the Setup menu. After pressing the enter key, the screen asks to select either single point or logged test data memory.
	The instrument must be connected to a computer with the Q-Trak Monitor software installed. Connect the RS-232 cable to the serial port on the computer. Connect the RJ45 connector end to the Q-Trak monitor communications port.
Print Data	Turn on the monitor and start the TrakPro software. Select FindPort to search for the monitor and OK to accept the setup.
	Ensure the monitor and printer are off. Locate the printer interface cable and connect the 9 pin adapter to the printer. Connect the other end to the monitor. Turn on the Q-Trak Plus monitor before turning on the printer.
Turn off unit	Press the on/off button to turn the unit off. All data will be stored for later review and downloading.

IH97260 Attachment 9.4 HP-IHP-97260

Environmental, Safety, Health & Quality Directorate
SHSD Industrial Hygiene

Operation of the Q-Trak Plus IAQ Monitor Job Performance Measure (JPM) Completion Certificate

Candidate's Name	Life Number:
------------------	--------------

Knowledge of the Principles of IAQ Investigations

Criteria	Qualifying Standard	Unsatis- factory	Recov- ered	Satisf- actory
Hazard Analysis	Understands the need to perform a hazard analysis of the sampling area and potential exposure to the sampler.			
Personal Protective Equipment	Understands the need to be aware of the potential IAQ causing agent to sampler and knows how to determine the need for PPE.			
Sampling Protocol	Understands the exposure monitoring logic necessary to appropriately select sampling locations to accurately measure worker, public and environmental exposure potential.			
Analysis of data	Understands the need to perform analysis on the sampling data to assess potential exposure to the sampler, worker, public and environment, and to recommend corrective actions as necessary, and employee notification.			

Practical Skill Evaluation: Demonstration of Sampling Methodology

Criteria	Qualifying Performance Standard	Unsatis- factory	Recov- ered	Satisf- actory
Sampling Equipment	Knows where equipment needed for the procedure is located and how to properly sign it out.			
Meter Operation	Demonstrates the proper way to set up, turn on and use the meter.			
Record forms	Shows how to correctly and completely fill all forms associated with this SOP.			
Data Analysis	Shows how to correctly have the data analyzed and compared to occupational exposure limits. Knows the correct OELs.			
Employee Notification	Knows how to timely and properly notify workers and management of over exposure. Knows how to inform workers and management of exposure that is within OEL.			

Employee: I accept the responsibility for performing this task as demonstrated within this JPM and the corresponding SOP.

Candidate Signature:	Date:
----------------------	-------

Evaluator: I certify the candidate has satisfactorily performed each of the above listed steps and is capable of performing the task unsupervised.

Evaluator Signature:	Date:
----------------------	-------