

# Quest Thermal Environmental Monitor Training Module

## Robust Construction



From the

# Market Leader





**QUEST**  
TECHNOLOGIES  
a 3M company



# You Will Learn...

- What – is a Quest Thermal Monitor?
- When and Why – will I use a Quest Thermal Monitor?
- How – are the Quest Thermal Monitors operated?
- What models and features are available?
- Where can I find out more?



# What is a Quest Thermal Environmental Monitor?

- The Quest Thermal Environmental Monitor is a Wet bulb, Dry bulb, Globe thermometer used to assess human heat stress.
- It uses an accepted method to gage the effects of temperature, humidity, and air flow on human subjects.
- Measurements valid per ISO, ACGIH, US NAVY & MARINE guidelines
- Models with both wet and waterless Wet bulb thermometers are available.
- Advanced features such as data logging and stay time calculations are optional.

# Major Components of a QUESTemp°44



The QT-44 Thermal monitor components include:

- *Removable Sensor bar including a Globe and Dry bulb thermometer along with a Humidity sensor*
- *RS232 connector*
- *Inputs for two additional sensor bars*
- *Two line easy to read display*
- *Membrane keypad*



# Basic Thermal Environmental Measurements

- Globe temperature – Indicates radiant heat
- Wet bulb temperature – Indicates the effect of humidity and air flow
- Dry bulb temperature – Standard ambient air temperature
- Wet Bulb Globe temperature
  - $WBGT (indoor) = 0.7WB + 0.3G$
  - $WBGT (outdoor) = 0.7WB + 0.2G + 0.1DB$
- Stay Times – Limit of exposure time
- Heat Index / Humidex – How warm it feels

# When to use a QUESTemp<sup>o</sup> Thermal Environmental Monitor



- Hot work environments such as foundries, kitchens, and bakeries
- Sports training and events such as football, tennis, and soccer games
- Military training and deployment where ever heat exposure may be a problem



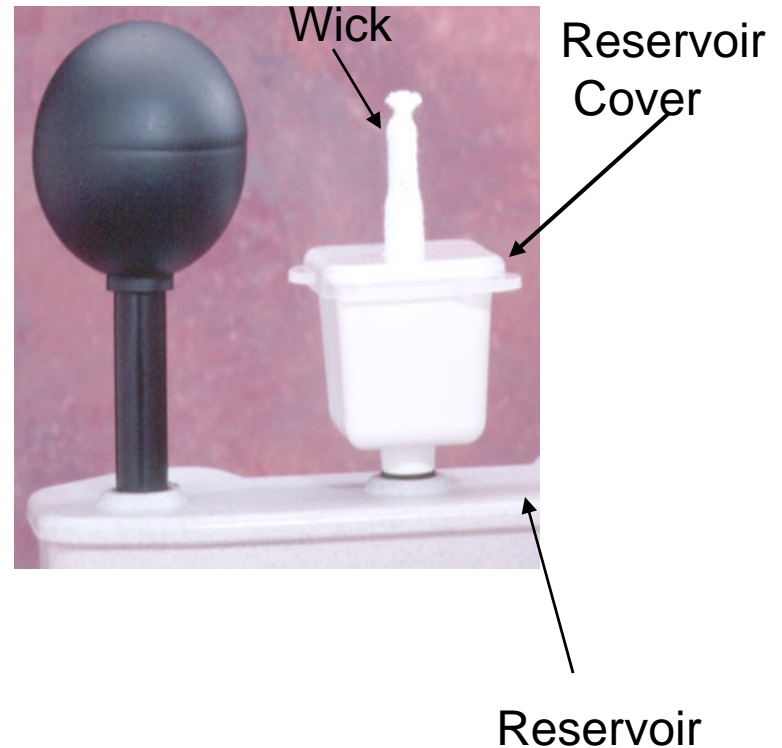
# How to Run an Area Heat Stress Survey

1. Make sure the wet bulb wick is clean. Fill reservoir with distilled water. **Note:** This step can be skipped if a waterless model.
2. Place the instrument in the work area approx. 3.5 feet off the ground.
3. Turn unit on. If the battery is less than or equal to 6.4 volts replace or recharge the battery.
4. Allow 10 minutes for sensors to stabilize.
5. Press RUN/STOP key to begin data logging.
6. Use arrow keys to display desired measurements.
7. Download data



# 1. Check and Fill Wet bulb Reservoir

- Make sure the wet bulb wick is clean. If not replace it.
- Remove reservoir cover and fill with distilled or de-ionized water.
- Replace reservoir cover



## 2. Place the Instrument

- Place the instrument in the work area approx. 3.5 feet (1 meter) off the ground.
- Make sure it is in similar conditions as the worker but in a safe place.



### 3. Power On and Check the Battery

- Press the I/O Enter button to turn the unit on.
- During power up watch the display for the battery voltage.
- If the battery voltage is 6.4 volts or less, replace or recharge the battery depending on type of battery.



## 4 / 5. Warm-up and Run a survey

- Allow ten minutes for the sensors to stabilize.
- Press the Run/Stop button to begin data logging.



Run / Stop button

## 6. Use Arrow Keys to Display Desired Measurements

<b>WET</b>	<b>80.5° F</b>	<b>▶ 1</b>
<b>DRY</b>	<b>92.2° F</b>	<b>*</b>

**Wet and Dry screen**

<b>GLOBE</b>	<b>92.4.° F</b>	<b>▶ 1</b>
		<b>*</b>

**Globe screen**

<b>WBGT<sub>i</sub></b>	<b>84.1 ° F</b>	<b>▶ 1</b>
<b>WBGT<sub>o</sub></b>	<b>107.5 ° F</b>	<b>*</b>

**WBGT<sub>i</sub> & WBGT<sub>o</sub> screen**

<b>RH</b>	<b>66.2 %</b>	<b>▶ 1</b>
<b>H.I.</b>	<b>84.3° F</b>	<b>*</b>

**RH and H.I./HU screen**

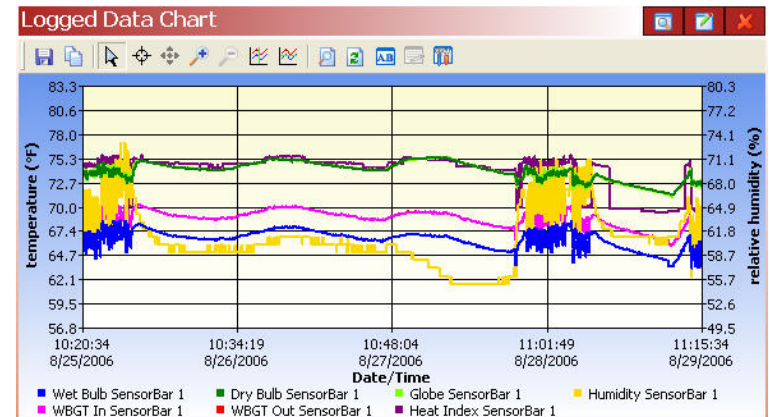


Arrow Keys



# 7. Download Data and Evaluate Results

- Transfer data to QSPII
- Print data to a computer using a program such as Windows HyperTerminal.



Page 1

QUEST TECHNOLOGIES  
HEAT STRESS REPORT

File Name \_\_\_\_\_ Questemp 36 Rev 1.00  
Serial # TK09090909

Employee \_\_\_\_\_

Facility \_\_\_\_\_ Session (3)  
Start: 21-FEB-08

11:07:32 Department \_\_\_\_\_ Stop: 21-FEB-08  
11:10:15

Job \_\_\_\_\_ Printed: 21-FEB-08  
11:16:00

Comments/Notes \_\_\_\_\_

Logging Interval: 1 minutes  
Degrees Fahrenheit

MAXIMUM LEVELS, Sensor 1			
WBGT IN	69.2	21-FEB-08	11:10:14
WBGT OUT	68.3	21-FEB-08	11:10:08
WET BULB	59.7	21-FEB-08	11:10:08
DRY BULB	82.7	21-FEB-08	11:09:56
GLOBE	91.4	21-FEB-08	11:10:12
HEAT INDEX	0	00-XXX-00	00:00:00



# Advanced Features

The QUESTemp° 36 and 46 have these additional features

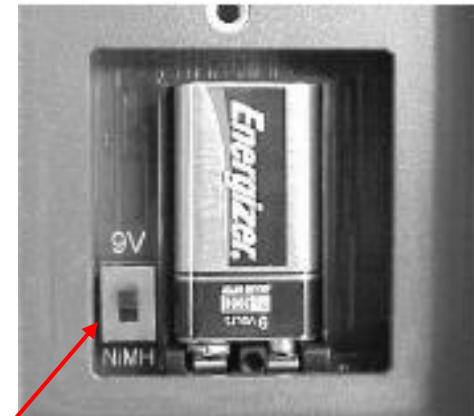
- *Optional hot wire anemometer allows*
  - *Air flow rate*
  - *PPD – Predicted Percentage Dissatisfied*
  - *PMV – Predicted Mean Vote*
- *Stay Times*
  - *ACGIH*
  - *Navy PHELs*
  - *Marine Flag System*
  - *EPRI*



# Trouble Shooting

My QUESTemp<sup>o</sup> Heat Stress Monitor will not turn on. What should I do?

- *Replace the battery*
- *If using a standard 9 volt battery, make sure the battery switch is in the 9V position.*
- *If you are using the re-chargeable pack, make sure the battery switch is in the NiMH position.*
- *Re-charge the NiMH pack.*



Battery Switch



For more information.....

- Glossary of Terms
- Product Manual
- Frequently Asked Questions