

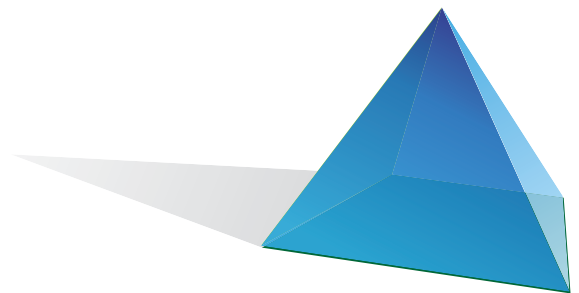




INSTALLATION AND WIRING MANUAL

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GENERAL

Specifications



GENERAL SPECIFICATIONS

Electrical

Face Velocity Range	0 – 200 ft/min
Accuracy of Measurement	±2 ft/min*
	*NIST Traceable / Individual certification available as option
Power Supply	Class 2, 24Vdc ±10% wall adapter provided
Recommended Cable Type	Belden 1325A

Touch Screen User Interface

LCD Size	3.2" diagonal
LCD Type	Transmissive
Resolution	240 x 320 portrait
Viewing Area	50.60 mm x 66.80 mm
Color Depth	18-bit or 262K colors
Backlight Color	White
Luminous Intensity	min 2500 cd/m2

*Accuracy is ± 5FPM when velocity drops below 60FPM or exceeds 140 FPM

Specifications

Mechanical

HMS1650-LITE Surface-mount Enclosure	3"W x 5"H x 0.75"D
External Remote Sensor Housing	2"W x 3"H x 2.7"D
Stainless Steel Cover Plate for Flow Tube	2.7"W x 4.5"H x 0.2"D
HMS1650-LITE w/ Flow Tube Cover Plate	approx. 3.5 lb
HMS1650-LITE w/ Sidewall Sensor	approx. 4.0 lb
Flow Tube Cover Plate Mounting	Flush

Environmental

Operating Temperature	32° to 125° F Operating
Operating Humidity	10% - 95

Part Number Guide: HMS1650-LITE



GENERAL

Overview

The **TRIATEK HMS1650-LITE Series Fume Hood Monitor** is an ultra-sensitive instrument used to monitor the face velocity of fume hoods in laboratories and clean rooms. This unit is a precision measuring system capable of measuring and displaying face velocities as low as 2 ft/min.

Key features of the HMS1650-LITE include:

- Full-color touch screen display with programmable display options and adjustable backlight
- Intuitive user interface simplifies setup and configuration of unit
- Display background changes color to indicate hood status at a glance
- Custom wallpaper background may be installed at the factory
- Audible and visual alarm annunciation
- Multi-level password protection of touch screen user interface
- Simple field calibration of sidewall sensor and sash position sensor

The HMS1650-LITE is equipped with a 3.2" diagonal **Full-color Touch Screen** and displays in portrait orientation (240 pixels by 320 pixels). The password-protected menu tree is very intuitive and simplifies the setup and configuration of the unit. The menus incorporate touch-based interfaces such as sliders, radio buttons, and dialog popup windows to facilitate the ease-of-use of the HMS1650-LITE.

The display implements bright background color changes to indicate the three different **Hood Status** indications of the monitored fume hood. These background colors indicate "**Normal**" when the face velocity at the sash opening is within defined limits, "**Warning**" when it is nearing an out-of-limits condition, and "**Alarm**" when the face velocity is outside

defined acceptable limits. The face velocity ranges for these conditions are easily set by the user for the specific installation when necessary. The background color changes provide an overview of the monitored fume hood face velocity conditions at a glance.

Alarm conditions may be defined by the user, in terms of desired face velocity settings for the fume hood being monitored. When an alarm condition occurs, it may be annunciated in two user-definable ways: 1) on the display, and/or 2) with an audible alarm. The alarm will automatically reset when the unit has sensed that the fume hood face velocity has returned to proper limits. The attendant may easily mute the audible alarm by touching the **OK** button on the alarm notification message popup window of the touch screen display.

The HMS1650-LITE provides an optional **Analog Input** that may be used for monitoring the sash position of the fume hood using Triatek's sash position sensor (POS-100). The sash position sensor allows the HMS1650-LITE to monitor and display the current sash height in real-time after being field-calibrated following installation.

Multiple multi-level **Passwords** may be configured to prevent the unauthorized or casual access to the HMS1650-LITE configuration settings. Up to ten passwords of up to eight digits may be stored, with each having one of four associated access levels. Administrators and Facility Management personnel may have unrestricted access, while general staff may be assigned restricted access passwords which limit the functionality of the user menus.

The HMS1650-LITE fume hood monitor is powered by a supplied wall adapter power

supply. This power supply also provides power to the sidewall sensor module which monitors the effective face velocity at the sash opening. A 10-foot length of 4-conductor cable is supplied with the HMS1650-LITE to interface the sidewall sensor module to the touch screen display module.

Installation

The HMS1650-LITE model includes a sidewall velocity sensor for measuring the face velocity of the monitored fume hood. This sensor module must be installed at the sidewall of the monitored fume hood. Tools required for the installation include: drill, 3/4" drill bit, 3/8" drill bit, 1/4" drill bit, 1/8" drill bit, #2 Phillips screwdriver, standard medium blade screwdriver, and silicone sealant. An interface cable is included and pre-wired to the sensor module that connects it to the touch screen display module. The system is powered by a plug-in wall adapter power supply. Therefore, a standard 110Vac electrical receptacle must be available nearby. The ideal location for this receptacle is on top of the fume hood cabinet. The loose end of the power supply cable from the wall adapter must be routed down to the location of the sidewall sensor module. Leave the wall adapter power supply unplugged during the installation procedure.

NOTE: While the HMS1650-LITE model is calibrated and programmed at the factory with default settings for typical fume hood applications, a final calibration of face velocity and sash position (if so equipped) is usually required following installation.

Installation

1. Proper location of the sensor is very crucial for obtaining the best possible operation of the HMS1650-LITE. The system uses through-the-wall sensing to measure the internal negative pressure of the fume hood to accurately determine the face velocity at the sash opening. The sensor must be located in a position that is least affected by turbulent air within the fume hood. See the illustration on page 5. There are two types of fume hood arrangements which need to be considered: **By-Pass** and **Non-By-Pass**.

- **Front-to-Back Position** – With either type, the sensor is best located approximately 6 inches back from the vertical sash track.
 - **Vertical Position (By-Pass type)** – Locate the sensor vertically in the center of the region between the bottom of the sash in it's fully open position and the bottom edge of the by-pass opening.
 - **Vertical Position (Non-By-Pass type)** – Locate the sensor vertically 6" above the bottom of the sash in it's fully open position.
2. See pages 5 and 6 for dimensions and suggested mounting arrangements of the TRIATEK flow sensor on the fume hood wall.
 3. Apply silicone sealant around the sensor immediately prior to mounting the assembly to its mounting surface. Be sure to leave red cap on careful to avoid getting sealant in the sensor port.

NOTE: Be certain that sensor reference port is in laboratory room air. If necessary to obtain this, use TRIATEK HMS-1600L-PLATE mounted on exterior panel of the fume hood.

4. See page 7 for mounting details for the HMS1650-LITE touch screen display unit. The preferred location is eye-level, usually on one of the side bezel panels. Please note that the display unit is cable connected to the sidewall sensor module, and provisions must be made to route the cable without interference with the fume hood sash or sash cable.

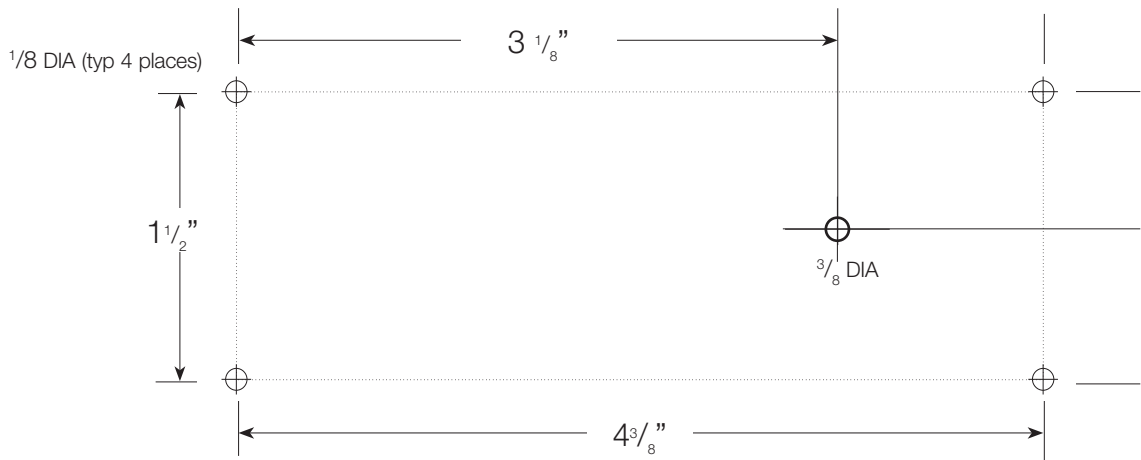
NOTE: Remove red cap from sensor

after installation.

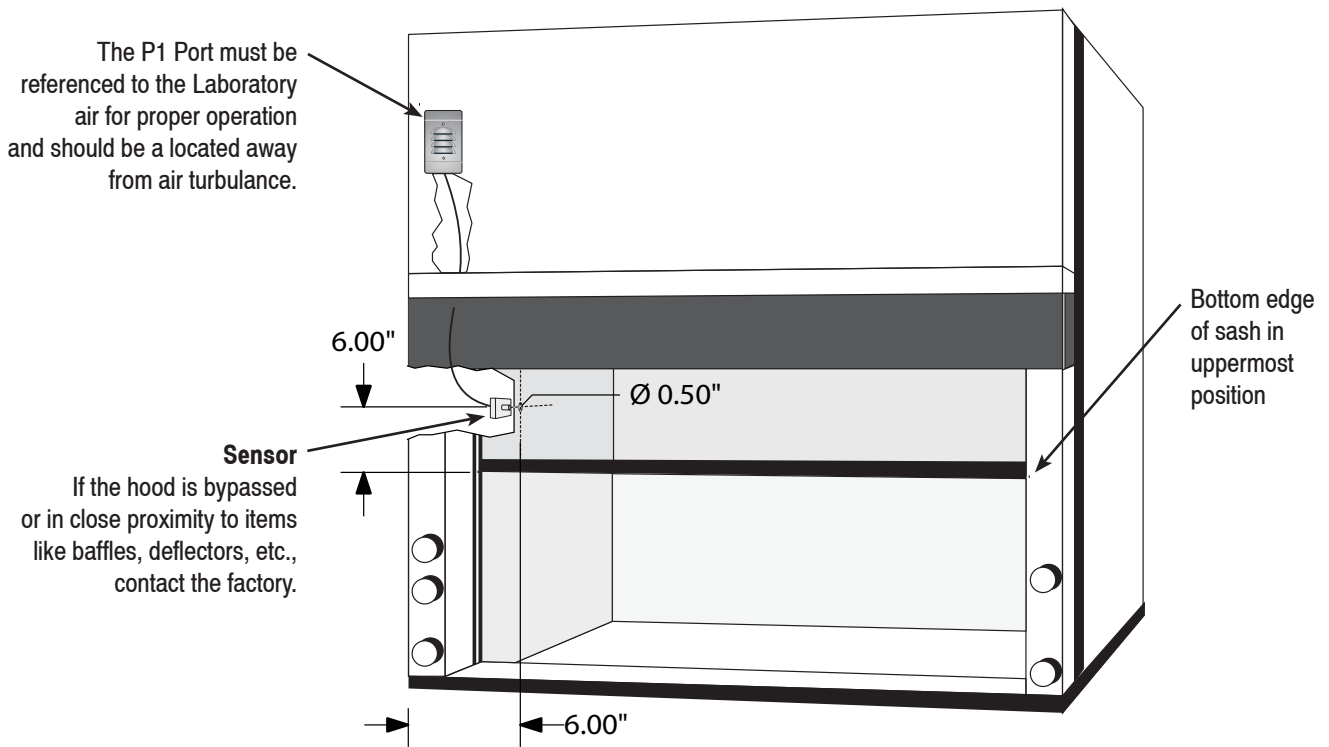
5. Connect the interface cable between the sidewall sensor module and the touch screen display before applying power to the system. Plug the wall adapter power supply into an available electrical receptacle, preferably at the top of the fume hood cabinet.

MOUNTING/WIRING

Sensor Mounting Location



Sensor Placement - Non By-Pass Type



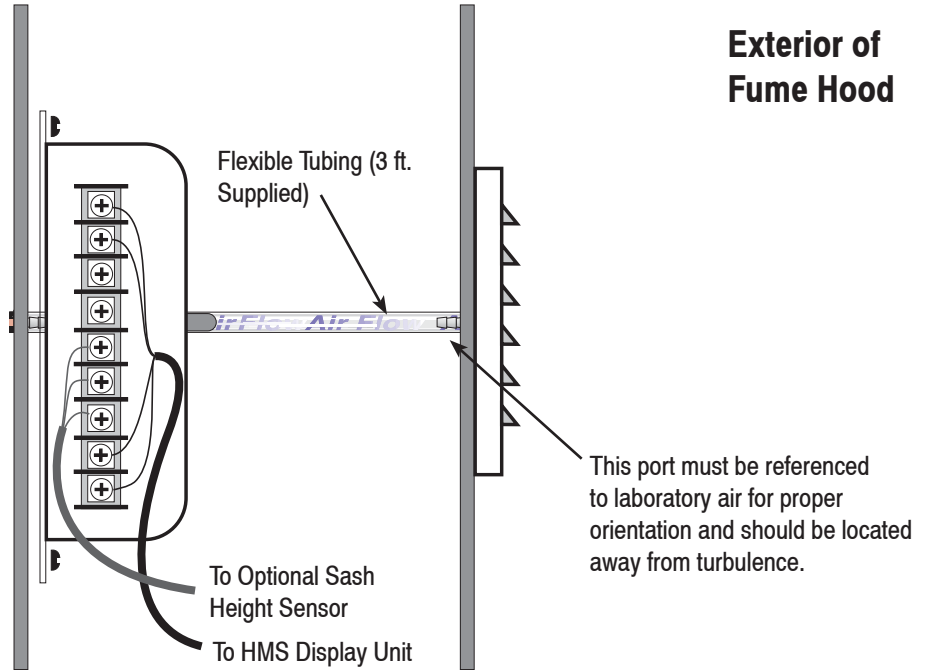
MOUNTING/WIRING

Sensor Mounting Location

Interior of Fume Hood

Exterior of Fume Hood

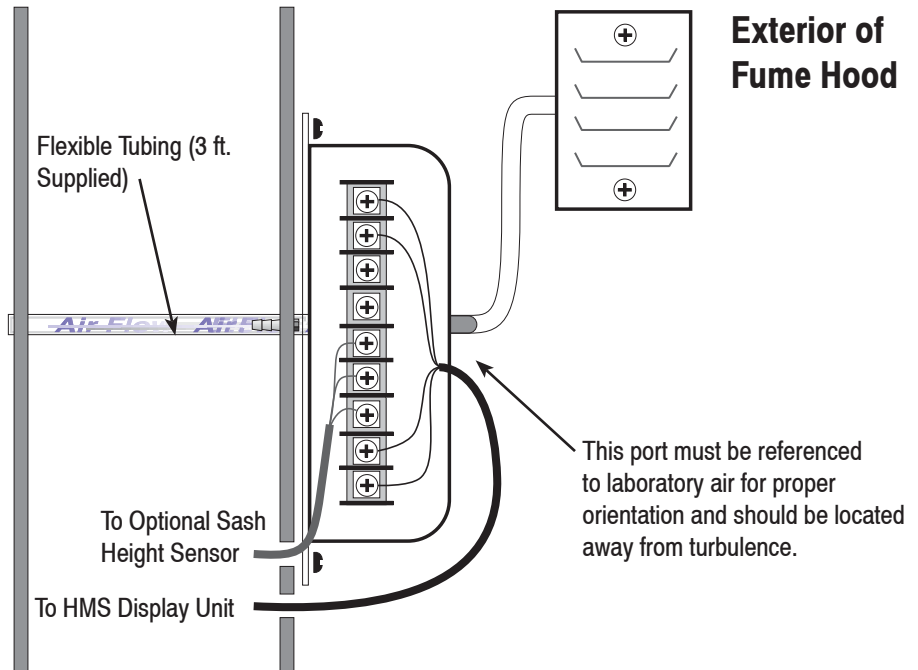
**FIGURE 1
Preferred Sensor
Mounting**



Interior of Fume Hood

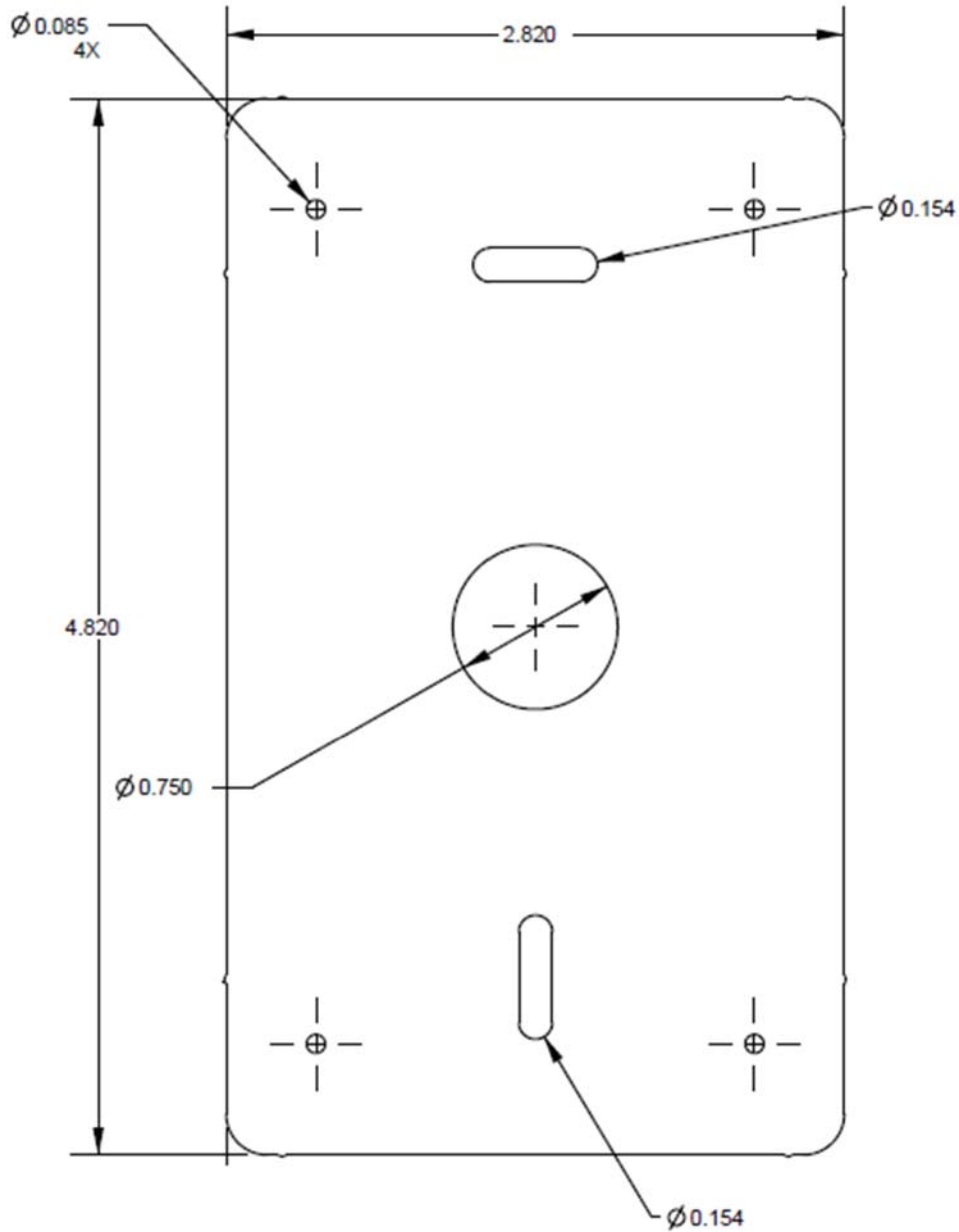
Exterior of Fume Hood

**FIGURE 2
Alternate Sensor
Mounting**



MOUNTING/WIRING

Display Mounting Hole Pattern



The HMS-1650-LITE display backplate may be mounted directly to a standard single-gang wall box using the two slots along the centerline. Use the backplate as a template to mark the mounting holes and the cable access hole at the center of the backplate.

HMS-1650-LITE Basic Programming

After the HMS1650-LITE unit has been properly installed, apply power to the unit by inserting the wall adapter into an available electrical receptacle. On power up, the LED backlighting will cycle through the three unit status colors (*green, yellow, red*) as part of the power-up initialization sequence, followed by the displaying of the Triatek splash screen indicating serial numbers, firmware version numbers, and sensor calibration date. This splash screen remains displayed for approximately 5 seconds and then disappears to reveal the main display screen. This splash screen information can also be redisplayed using the **About This HMS** option on the **Diagnostics** menu.

Main Display Screen

All HMS1650-LITE units come shipped from the factory in the **Standby** operating mode. If your HMS1650-LITE order included the custom logo option, then your specified logo will be shown on the main display screen while the unit is in standby operating mode. Otherwise, the standby operating mode will be represented by white text on a blue background (Figure 3). Information displayed on the main screen includes the following:

- Name of monitored fume hood (up to 20 chars)
- Current operating mode (occupied, unoccupied, or standby)
- Current face velocity reading in selected engineering units (default is ft/min)
- Current time and date

While in standby operating mode, the background color of the main display screen is either blue or a custom color that complements the custom logo if installed. However, while in either **Occupied** or **Unoccupied** operating modes, the

background color actively represents the current status of the monitor. A *green background* indicates that the current face velocity is within allowable limits of the desired setpoint. A *yellow background* indicates current face velocity has drifted outside of the allowable limits of the desired setpoint and are in the caution range. A *red background* indicates that the current face velocity has reached a critical condition and is outside of the allowable limits of the desired setpoint.

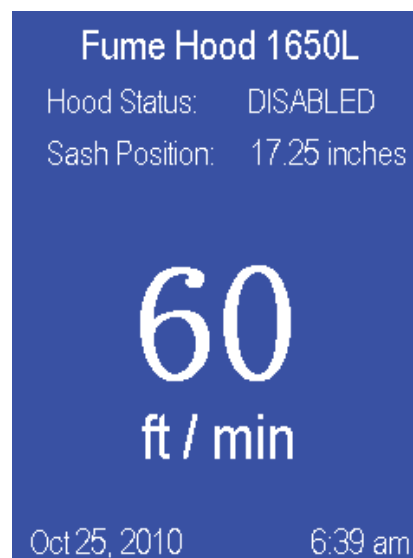


Fig 3. Mounting plate used to install flush mount model for retrofit applications.

The HMS1650-LITE incorporates a full-color touch screen and includes an extensive easy-to-use menu system that allows the user to quickly setup the monitor for immediate use. Also integrated into the HMS1650-LITE display are several hotspots that provide quick access to various settings. See page 12 for details on using these hotspots as display settings shortcuts. Touching the screen anywhere other than one of the

reserved hotspots invokes the menu system, unless one or more security passwords have been entered. These hotspots are disabled whenever the specific display option is turned off.

Configuring the Fume Hood Monitor

Configuring the HMS1650-LITE fume hood monitor settings is extremely easy using the intuitive user menus integrated in the touch screen display. Within minutes, the HMS1650-LITE may be configured to start displaying the real-time face velocity of the fume hood being monitored. We begin by performing a field calibration of the face velocity in the next section.

Field Calibrating the Sidewall Sensor

Selecting the **Field Calibration** option on the **Hood Setup** menu invokes the **Field Calibration** popup screen as shown in Figure 4, where the sidewall-mounted velocity sensor may be calibrated after the installation process has been completed.

Temporarily cap the sidewall velocity sensor to inhibit flow air flow and wait for the reading to stabilize before continuing. Once the face velocity reading stabilizes, click the **Next** button to advance to the next step of the calibration procedure as shown in Figure 5.

PROGRAMMING

HMS-1650-LITE Basic Programming



Fig 4. Sidewall sensor must be recalibrated once installed at the monitored fume hood.

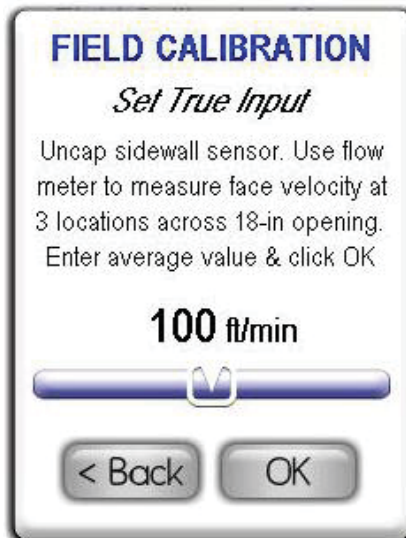


Fig 5. The average of three face velocity measurements must be entered here to complete the calibration procedure.

At this step, uncap the sidewall sensor, set

the sash to a height of approximately 18 inches, and measure the face velocity at three locations across the sash opening using a calibrated flow meter. Enter the average of the three measurements on the **Field Calibration** popup screen using the slider, and click the **OK** button to save the new calibration to non-volatile memory. This completes the sidewall-mounted velocity sensor field calibration procedure. If the HMS1650-LITE fume hood monitor includes a Triatek sash position sensor (POS-100), it must be calibrated following installation. This section discusses the procedure for performing a field calibration of the sash position sensor.

Field Calibrating the Sash Position Sensor

Selecting the **Field Calibration** option on the **Sash Setup** menu invokes the popup calibration screen as shown in Figure 6, where the sash position sensor may be calibrated once it has been installed at the fume hood.

To begin the calibration procedure, set the sash to its minimum opening and measure the height. If the sash opening is completely closed, then enter zero. If the sash opening is partially open, then measure and enter the height at the calibration screen using the slider and click the **Next** button to advance to the next step of the sash calibration procedure (Figure 7).

Move the sash to its maximum opening, measure the height, and enter it using the slider on the **Field Calibration** popup screen. Click the **OK** button to save the new calibration to non-volatile memory. This completes the field calibration procedure for the sash position sensor.



Fig 6. If sash position sensor is connected, it must be recalibrated following installation.



Fig 7. Set sash to maximum position and enter the height to complete the calibration procedure.

HMS-1650-LITE Basic Programming

Setting Up Alarm Limits

To determine the various setpoints at which the unit status changes from *normal* to *warning*, and from *warning* to *alarm*, the alarm limits must be configured accordingly. Alarm limits are only in effect while the unit is in either *occupied* or *unoccupied* operating mode, as the alarms are disabled while *standby mode* is active. In order to specify the alarm limits for *occupied* or *unoccupied* operating mode, set the *operating mode* accordingly by selecting the **Hood Setup** option from the *Unit Setup* menu, and then select the **Operating Mode** option from the **Hood Setup** menu. Select the desired operating mode from the resulting configuration popup window.



Fig 8. Enter high alarm setpoint for occupied mode using popup keyboard.

To begin specifying the alarm and warning setpoints, select the **Alarm Limits** option from the **Unit Setup** menu. The user is prompted to sequentially enter the high alarm and warning limits, followed by the low warning

and alarm limits, in that order. For example, if occupied operating mode was selected above, then the configuration popup shown in Figure 8 will be displayed, prompting the user to enter the **Occupied Mode High Alarm Setpoint** using the keypad. These limits should be specified to identify the face velocity range which is considered normal, as well as the range which indicates a warning condition, and the range which is considered critical and indicates an alarm condition.

Configuring Alarm Buzzer

The HMS-1650 alarm resources provide support for both visual and audible alerts. The **Audible Alert** option on the **Unit Setup** menu allows the alarm buzzer settings to be easily configured. Selecting this option invokes the configuration screen shown in Figure 9.

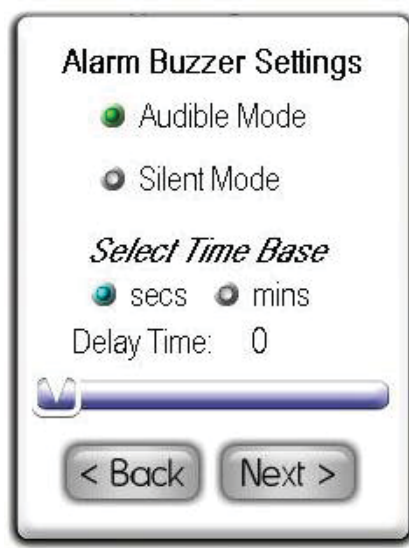


Fig 9. Alarm buzzer may be configured for audible or silent mode.

The alarm buzzer may be selected for one of two modes of operation: **Audible** or **Silent**

Mode. If audible mode is selected, a delay may be specified in seconds or minutes. If **Silent Mode** is selected, then the alarm buzzer will not sound whenever the unit encounters an alarm condition.

If **Audible Mode** is selected, the user may specify an **Alarm Quiet Period**. This feature allows the audible alerts to be suppressed between the specified hours every day, thereby eliminating the potential for nuisance alarms. Hospitals may take advantage of this feature to minimize nuisance alarms during non-visiting hours in patient rooms.

Selecting Displayed Units

The HMS1650-LITE displays face velocity readings in one of two units: *ft/min* or *m/sec*. The **Engineering Units** option on the **Unit Setup** menu allows the displayed units to be selected by the user. Selecting this option invokes the **Select Engineering Units** selection screen. If the engineering units selection is changed, the corresponding alarm setpoints are automatically converted to the newly selected units.

Configuring Display Options

The **Display Setup** menu provides support for configuring all of the display settings on the HMS1650-LITE. Options are available for configuring the main display, selecting an alternate language for the user interface menus, setting the system time and date, and adjusting the display brightness.

The **Display Options** menu item allows the main display to be configured as required by the specific application. If so desired, the user may individually *enable* or *disable* the display of the fume hood status and the time/date at the bottom of the screen.

PROGRAMMING

HMS-1650-LITE Basic Programming

The **Set Time & Date** option on the **Display Setup** menu allows the user to specify the current time and date that may be displayed at the bottom of the main display. The HMS1650-LITE will maintain the time and date as long as the unit is not powered down.

The final option available on the **Display Setup** menu allows the intensity of the display backlighting to be adjusted from very dim to very bright. The **Brightness** settings are saved in nonvolatile memory and remain in effect through a power cycle.

Adding Password Security

Access to the HMS1650-LITE menu system can be protected from unauthorized tampering through the use of multi-level security passwords. Up to ten individual passwords may be entered in the system, each with a specific access level.

A password entry may be created by selecting the **Passwords Setup** option from the **System Setup** menu, and then selecting the **Add Password** option. The user is prompted to enter a minimum of four and up to eight numeric digits.

Once a password has been specified, the user is prompted to specify one of four access levels: **Unrestricted**, **Standard**, **Basic**, and **Restricted**. All password entries are saved to non-volatile memory, and remain in effect through a power failure. In the event that a password has been forgotten, there is a factory-default "back door" password that will provide unrestricted access to the user menu system. Please consult with the factory for more information regarding this password.

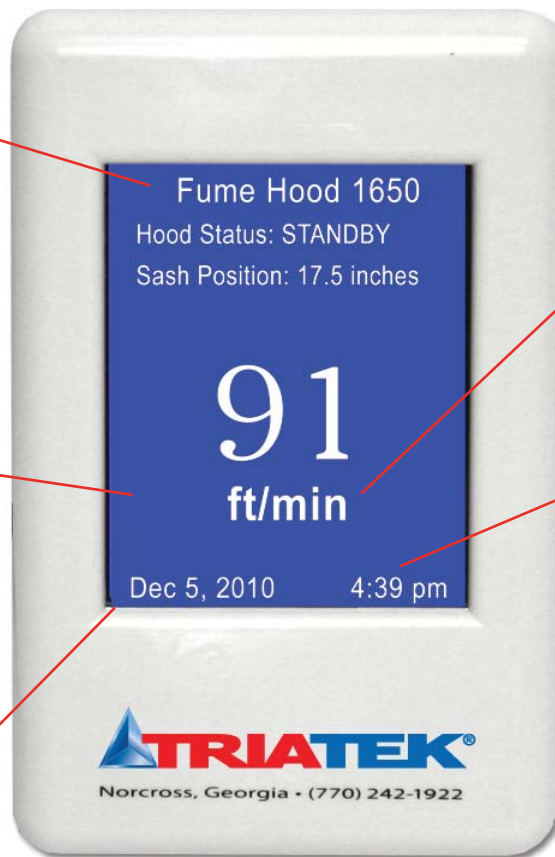
CLEANING THE DISPLAY

- The cloth may be used dry, or lightly dampened with a mild cleaner or Ethanol.
- Be sure the cloth is only lightly dampened, not wet. Never apply cleaner directly to touch panel surface; if cleaner is spilled onto touch panel, soak it up immediately with absorbent cloth.
- Cleaner must be neither acid nor alkali (neutral pH).
- Wipe the surface gently; if there is a directional surface texture, wipe in the same direction as the texture.
- Never use acidic or alkaline cleaners, or organic chemicals such as: paint thinner, acetone, toluene, xylene, propyl or isopropyl alcohol, or kerosene.

Touching the current hood name text brings up an alphanumeric keyboard to quickly change the name of the monitored fume hood.

Touching anywhere else on the screen enters the Main Setup Menu if no password is stored. Otherwise, a password must be entered before the Main Setup Menu can be accessed.

Touching DATE brings up the Date Entry popup to quickly change the current displayed date.



Touching the engineering units selection brings up a popup to quickly change velocity measurement units.

Touching TIME brings up Time Entry popup to quickly change the current displayed time.

**Hot-Spot Features of HMS-1650-LITE
Touch Screen Display**

TRIATEK, located in Norcross Georgia, has an extensive network of manufacturer's representatives located throughout North America to service you. Our helpful, experienced sales team can provide solutions for your Laboratory Controls, Medical Controls, HVAC Controls, and Industrial Instrumentation needs. Call **770-242-1922** or visit our website at: www.triatek.com for more information or to find an agent near you.



Triatek has been a pioneer in controllers since its origins back in the 1980's. Today, Triatek has the most complete line of controllers and monitors in the industry - the latest of which use full color touchscreens. Additionally, Triatek is unique in that the company engineers and sells both venturi valves and controllers or monitors. In other words, Triatek is the one company that can be turned to for a complete air pressure solution.



Laboratories



Classrooms



Vivariums



Hospitals

