

Fume Hood Monitor Owner's Manual

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SERVICE STATEMENT

Control devices are combined to make a system. Each control device is mechanical in nature and all mechanical components must be regularly serviced to optimize their operation. All Siemens Building Technologies branch offices and authorized distributors offer Technical Support Programs that will ensure your continuous, trouble-free system performance.

For further information, contact your nearest Siemens Building Technologies, Inc. representative.

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TO THE READER

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How To Use This Manual

This manual is written for the owner and user of the Siemens Building Technologies, Inc. Fume Hood Controller. Direct communication with the Fume Hood Controller is accomplished by using the portable operator's terminal and CIS. For more information about these products, contact your local Siemens Building Technologies, Inc. representative. This section covers manual organization, manual conventions and symbols used in the manual, how to access help, related publications, and any other information that will help you use this manual.

Manual Organization

This manual contains the following chapters:

- *Chapter 1 - Introduction* describes the basic functionality of the FHM.
- *Chapter 2 - External Hardware Components* describes the external components of the FHM.
- *Chapter 3 - Internal Hardware Components* describes the internal components of the FHM.
- *Chapter 4 - Application 651—Operating Mode* describes the control applications available in the FHM.
- *Chapter 5 - Application 650—Slave Mode* describes the control applications available in the FHM.
- *Chapter 6 - Point Database* defines the point database descriptors and includes addresses and applications.
- *Chapter 7 - Hardware and Software Troubleshooting* describes corrective measures you can take should you encounter a problem when using a FHM or the CIS. For issues not covered in this section, contact your local Siemens Building Technologies, Inc. representative.
- A *Glossary* describes the terms and acronyms used in this manual.
- An *Index* is provided to assist you in finding information.



Manual Conventions

The following table lists conventions to help you use this manual in a quick and efficient manner.

Convention	Example
Numbered Lists (1,2,3...) indicate a procedure with sequential steps.	1. Turn OFF power to the field panel. Turn ON power to the field panel. 2. Contact your local Siemens Building Technologies representative.
Actions that you should perform are specified in boldface font.	Type F for Field panels. Click OK to save changes and close the dialog box.
Error and system messages are displayed in Courier New font.	The message Report Definition successfully renamed appears in the status bar.
New terms appearing for the first time are italicized.	The Open Processor continuously executes a user-defined set of instructions called the <i>control program</i> .

Manual Symbols

The following table lists the symbols used in this Owner's Manual to draw your attention to important information.

Notation	Symbol	Meaning
WARNING:		Indicates that personal injury or loss of life may occur to the user if a procedure is not performed as specified.
CAUTION:		Indicates that equipment damage, or loss of data may occur if the user does not follow a procedure as specified.

Getting Help

For more information about the Fume Hood Controller, contact your local Siemens Building Technologies, Inc. representative.

Where To Send Comments

Your feedback is important to us. If you have comments about this manual, please submit them to technical.editor@sbt.siemens.com

1

Introduction

Chapter 1 describes the Fume Hood Monitor and accessories. The following topics are discussed:

- Fume Hood Monitor (FHM) Controller
- Communicating with Your FHM
- Ordering Information

Fume Hood Monitor (FHM) Controller

The Fume Hood Monitor (FHM) is a display device, as well as the interface between the current operating condition of the fume hood and the operator. The FHM provides a digital readout of the face velocity and displays normal and alarm conditions to the operator through green and red LED indicators and displayed text.

Communicating with Your FHM

Direct communication with the FHM is accomplished by using the Portable Operator's Terminal and Computer Interface Software (CIS). For more information about these products, contact your local Siemens Building Technologies, Inc. representative.

Ordering Information

To order new products or documentation, contact your Siemens Building Technologies, Inc. representative.

Product	Part Number
Fume Hood Monitor	546-00303
Fume Hood Monitor User's Card	125-1990
Fume Hood Monitor Owner's Manual	125-1991

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External Hardware Components

Chapter 2 describes the external Fume Hood Monitor hardware. Chapter 2 discussed the following topics:

- Fume Hood Monitor
- External Components
 - LCD Text Strings
 - LED status
 - Button functions
- Portable Operator's Terminal port
- Airflow sensor input

The Fume Hood Monitor

The *Fume Hood Monitor (FHM)* is a Siemens Building Technologies, Inc. Laboratory Control product. The FHM provides visual and audible alarms to alert a fume hood user of airflow conditions. The FHM can be mounted on fume hoods with or without existing cutouts.

External Components

Refer to Figure 2-1. The external components of the FHM include:

- Liquid Crystal Display (LCD)
- Light Emitting Diodes (LEDs) (2)
- Buttons (4)
- Portable Operator's Terminal port
- Airflow sensor input

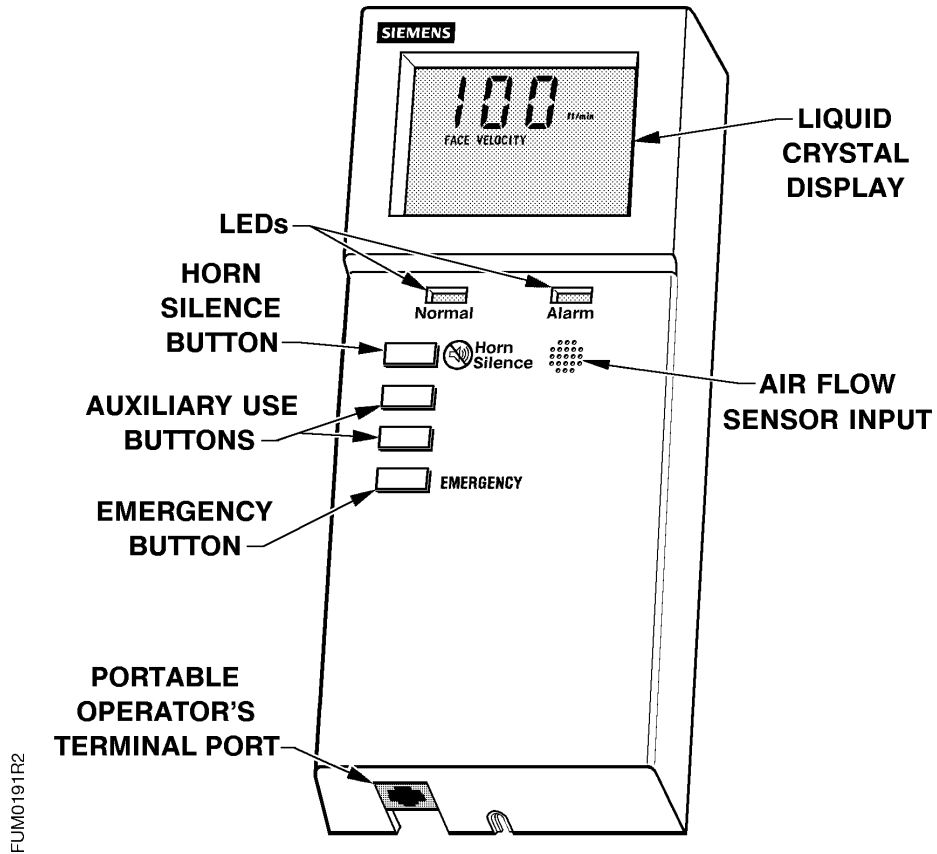


Figure 2-1. FHM External Components.

LCD Text Strings

The LCD can show the face velocity of the fume hood in ft/min. or m/sec. It also shows the status of the FHM with the following text strings:

Text String...	Indicates that...
LOW FACE VELOCITY	The fume hood airflow is below the limit.
HIGH FACE VELOCITY	The fume hood airflow is above the limit.
USER ALARM	The user pressed the EMERGENCY button.
GENERAL FAILURE	A hardware failure exists.

LED status

The LEDs indicate the following status:

LED color...	Indicates that the FHM is...
Green	Operating in a normal condition.
Red	In an alarm condition.

Button functions

The buttons on the FHM have the following functions:

Button	Function
EMERGENCY	Pressing this button indicates an alarm condition by turning: <ul style="list-style-type: none"> • The green LED OFF. • The red LED ON. • The horn ON.
Horn Silence	Pressing this button will turn the horn OFF.
Auxiliary (2)	These buttons may be used for digital inputs if the FHM is connected to a field panel or used as an OCC/UNOCC DI point.

Portable Operator's Terminal port

The *Portable Operator's Terminal port* allows direct communication with the FHM via a laptop computer and CIS. Using CIS, an operator can change point values and view reports.

Airflow sensor input

The *airflow sensor input* is an opening in the FHM to allow a portion of the air that flows into the fume hood to pass across the air flow sensor. The sensor determines the airflow rate of the fume hood.

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Internal Hardware Components

Chapter 3 describes the internal Fume Hood Monitor (FHM) hardware. Chapter 3 discusses the following topics:

- Circuit Board
- Alarm relay definition and specification
- Alarm buzzer definition and specification
- FLN trunk definition and specification
- Operating and power specifications
- Wiring diagram

Circuit Board

The printed circuit board of the FHM (Figure 3-1) is the central processing area. The following components are not visible once the FHM is installed:

- Airflow sensor hose connection
- Alarm relay (wire receptacle)
- Digital input (wire receptacle)
- Printed circuit board
- Alarm buzzer
- LAN trunk (wire receptacle)
- 24 Vac (wire receptacle)

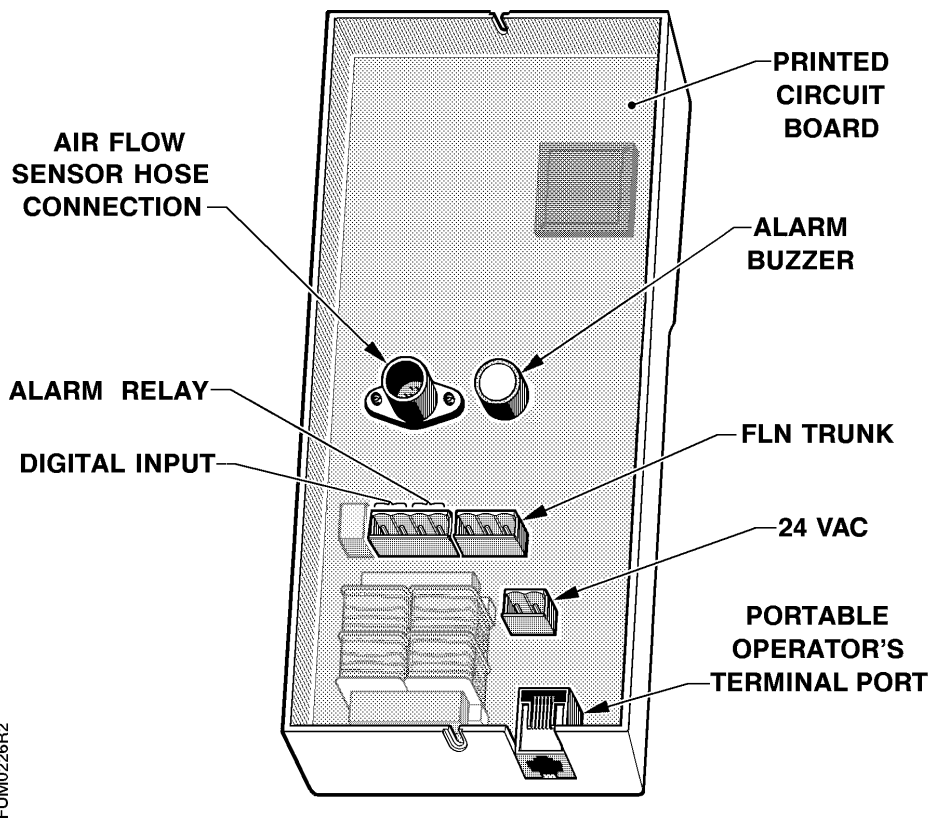


Figure 3-1. FHM Internal Components.

Alarm relay

The *alarm relay* is a set of contacts that can be used, with the appropriate wiring, to indicate an alarm condition to a centralized control system.

Alarm relay contact status...	Indicates that the fume hood...
Closed	is operating in a normal condition.
Open	is operating in an alarm condition.

Specification

Alarm relay contacts	N.C., dry contacts, 24 Vac maximum (12 VA), Class 2
----------------------	---

Digital input

The *digital input* (DI) is an auxiliary input that can be used for the input of DI Functions or for custom-defined operations. The DI functions are: Sash height alarm, high face velocity alarm disable, DI alarm point of OCC/UNOCC monitor. This is a dry contact input.

Specification

Recommended wire	20 AWG Twisted Shielded Pair (TSP)
Recommended max. wire length	100 ft. (30.5 m)
Max. input contact resistance	1000 Ω

Alarm buzzer

The *alarm buzzer* is an audible horn that sounds when the fume hood is operating outside the normal conditions. When the sash status feature is enabled, the buzzer will pulse six times per minute (1 second ON, 1 second OFF).

Specification

Alarm buzzer	85 dB @ 4 in. (10 cm), 2.3 KHz resonance
---------------------	--

FLN trunk definition and specification

The *FLN trunk* is a set of contacts that can be used with appropriate wiring for a Floor Level Network (FLN) connection. These contacts can be used only when the FHM is connected to a field panel.

Specification

Recommended wire	24 AWG Twisted Shielded Pair (TSP), 12.5 pf/ft., 6 twists/ft. minimum, 4000 ft. maximum
-------------------------	---

Operating and power specifications

Operating temperature	32° to 120°F (0° to 120°C)
Operating range	24 Vac, 50/60 Hz
Power consumption	2.5 VA, Class 2, at 24 Vac

Wiring diagram

The following illustration (Figure 3-2) is the wiring diagram for the FHM.

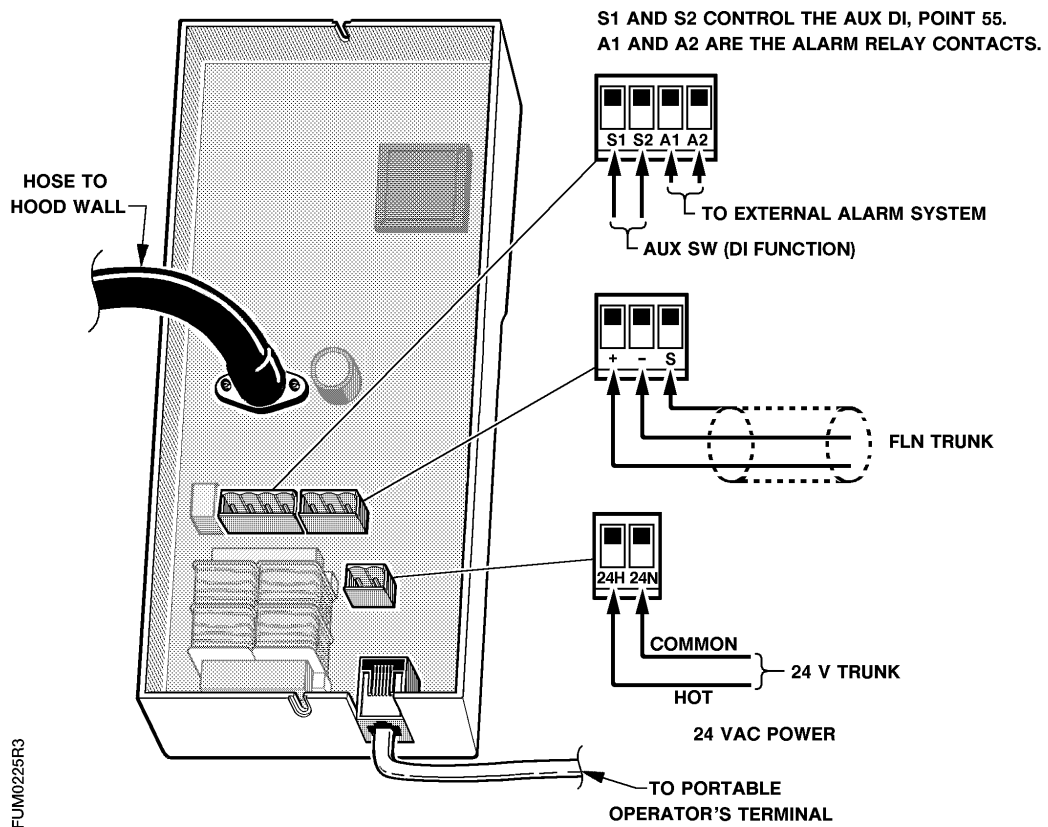


Figure 3-2. FHM Wiring Diagram.

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Application 651 – Operating Mode

Chapter 4 describes the Application 651 – Operating Mode available in the FHM.

The FHM may be stand-alone or connected to a field panel. The FHM can also send an alarm notification to a centralized control system. Table 4-1 contains Operating Mode point database information.

Overview

Application 651 is one of two FHM applications. This application is the Operating Mode, which determines the features that are available to the user.

Occupied/unoccupied mode

Application 651 is capable of using two modes, occupied and unoccupied, set the application to the appropriate mode using OCC UNOCC (Point 29).

The occupied mode is the most common Operating Mode. In occupied mode, the FHM does the following:

- Detects alarms
- Displays face velocity
- Allows the user to initiate an EMERGENCY alarm

The unoccupied mode is controlled from the field panel, AUX DI, or the AUX 2 button as defined by DI FUNCTION (Point 52) and is typically used when the FHM is not needed for monitoring alarm conditions.

If...	Then...	The FHM displays...
OCC UNOCC is set to UNOCC	the red LED illuminates, and the green LED turns OFF, and the FHM will not annunciate alarms.	OFF, and will not display face velocity.

Alarm actions

The FHM contains the following general alarm action sequence:

If...	Then...	The FHM displays...
the FHM detects an alarm	the green LED turns OFF, the red LED illuminates, ALARM STATUS (Point 7) changes from NORMAL to ALARM, the horn sounds, and the contacts of the alarm relay open.	LOW FACE VELOCITY, HIGH FACE VELOCITY, USER ALARM, or "EEE" depending on the type of alarm.

How to silence the horn

The user can silence the horn by pressing the Horn Silence button.

When...	Then...	Result...
the user presses the Horn Silence button	the horn no longer sounds	the red LED will stay illuminated until the alarm condition is cleared.

How to indicate an emergency alarm condition

The user can indicate an emergency alarm condition by pressing the EMERGENCY button.

When...	Then...	The FHM displays...
the user presses the EMERGENCY button	EMERGENCY (Point 64) will change from NORMAL to ALARM.	USER ALARM

How to clear an emergency alarm condition

During an alarm condition, the user can clear the emergency alarm by pressing the EMERGENCY button.

When...	Then...	The FHM displays...
the user presses the EMERGENCY button	EMERGENCY (Point 64) will change from ALARM to NORMAL.	current face velocity.

Alarm limits

The FHM contains low and high face velocity alarm limits, LO ALM LMT (Point 13) and HI ALM LMT (Point 10). These points apply to LOW ALM (Point 5) and HIGH ALM (Point 6).

When the face velocity is...	Then...	The FHM displays...
lower than LO ALM LMT (Point 13) for a time greater than ALARM TIME (Point 96)	LOW ALM (Point 5) will toggle to ON.	LOW FACE VELOCITY
greater than HI ALM LMT (Point 10) for a time greater than ALARM TIME (Point 96)	HIGH ALM (Point 6) will toggle to ON.	HIGH FACE VELOCITY

Fail-safe operation

The FHM has the following fail-safe operation:

When...	Then...	The FHM displays...
the FHM detects a hardware failure (such as a failed sensor or an internal start-up failure)	the status of ALARM STATUS (Point 7) will change to ALARM.	FFF and GENERAL FAILURE

NOTE: If FFF and GENERAL FAILURE display on the FHM, then call your Siemens Building Technologies, Inc. representative.

External alarm and notification

When power to the FHM is OFF, the contacts of ALARM RELAY (Point 41) will be open.

If the alarm relay contacts...	Then the FHM will...	After the FHM is powered up and conditions are normal...
are connected to a centralized control system and the power is OFF	send an ALARM condition to the centralized control system.	the contacts of ALARM RELAY will close, indicating a NORMAL condition to the centralized control system.

Point database

The following table contains all of the points in Application 651. Calibration Report points are numbered in the 80s. Set-up Report points are numbered in the 90s.

Table 4-1. Point Database for Fume Hood Monitor Application 651.

Point Number	Descriptor	Factory Default (SI units)	Engr. Units (SI units)	Slope (SI units)	Intercept (SI units)	On Text	Off Text
1	CTLR ADDRESS	99	--	1	0	--	--
2	APPLICATION	651	--	1	0	--	--
{4}	FACE VEL	--	FPM (MPS)	1	0	--	--
{5}	LOW ALM	OFF	--	--	--	ON	OFF
{6}	HIGH ALM	OFF	--	--	--	ON	OFF
{7}	ALARM STATUS	NORMAL	--	--	--	ALARM	NORMAL
{8}	GEN FAILURE	OFF	--	--	--	ON	OFF
{10}	HI ALM LMT	255 (1.28)	FPM (MPS)	1	0	--	--
{13}	LO ALM LMT	0	FPM (MPS)	1	0	--	--
{29}	OCC UNOCC	OCC	--	--	--	UNOCC	OCC
{41}	ALARM RELAY	NORMAL	--	--	--	ALARM	NORMAL
52	DI FUNCTION	0	--	1	0	--	--
{53}	SASH ALARM	NORMAL	--	--	--	ALARM	NORMAL
54	SASH TIME	120	SEC	1	0	--	--
{55}	AUX DI	OPEN	--	--	--	CLOSED	OPEN
{56}	BUTTON 1 (refer to NOTE 3)	OPEN	--	--	--	CLOSED	OPEN
{57}	BUTTON 2 (refer to NOTE 3)	OPEN	--	--	--	CLOSED	OPEN
{58}	BUTTON 3 (refer to NOTE 3)	OPEN	--	--	--	CLOSED	OPEN
{59}	BUTTON 4 (refer to NOTE 3)	OPEN	--	--	--	CLOSED	OPEN
{61}	HORN SILENCE	OFF	--	--	--	ON	OFF
{62}	AUX BUTTON 1	OFF	--	--	--	ON	OFF
{63}	AUX BUTTON 2	OFF	--	--	--	ON	OFF
{64}	EMERGENCY	NORMAL	--	--	--	ALARM	NORMAL

1. Points not shown in this table are not used with this application.
2. One value listed in a column indicates that the value is the same in English as it is in SI units.
3. Points represent hardware inputs and are used by the FHM firmware only.
4. Point numbers that appear in brackets { } may be unbundled at the field panel.

continued on the next page. . .

Table 4-1. Point Database for Fume Hood Monitor Application 651. (continued)

Point Number	Descriptor	Factory Default (SI units)	Engr. Units (SI units)	Slope (SI units)	Intercept (SI units)	On Text	Off Text
71	MAX RAW	150	--	--	--	--	--
73	MID RAW	100	--	--	--	--	--
75	MIN RAW	60	--	--	--	--	--
80	CAL REQUEST	NO	--	--	--	YES	NO
81	MAX FVEL	150 (0.76)	FPM (MPS)	--	--	--	--
82	MAX DONE	READY	--	--	--	READY	DONE
83	MID FVEL	100 (0.51)	FPM (MPS)	--	--	--	--
84	MID DONE	READY	--	--	--	READY	DONE
85	MIN FVEL	60 (0.31)	FPM (MPS)	--	--	--	--
86	MIN DONE	READY	--	--	--	READY	DONE
87	CAL COMPLETE	YES	--	--	--	YES	READY
88	CAL RAW	--	--	1	0	--	--
89	CAL TIME	20	SEC	--	--	--	--
91	BLANK DISP	OFF	--	--	--	ON	OFF
92	DISPLAY RES	10 (0.05)	FPM (MPS)	1	0	--	--
93	ENG UNITS	ENG	--	--	--	SI	ENG
94	LAMP TEST	OFF	--	--	--	ON	OFF
95	DISPLAY WT	100	PCT	0.4	0.0	--	--
96	ALARM TIME	5	SEC	1	0	--	--
98	DISPLAY MIN	40 (0.20)	FPM (MPS)	--	--	--	--
{99}	ERROR STATUS (refer to NOTE 3)	0	--	--	--	--	--

1. Points not shown in this table are not used with this application.
2. One value listed in a column indicates that the value is the same in English as it is in SI units.
3. Points represent hardware inputs and are used by the FHM firmware only.
4. Point numbers that appear in brackets { } may be unbundled at the field panel.

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Application 650 – Slave Mode

Chapter 5 describes the Application 65 – Slave Mode available in the FHM.

When the FHM is connected to a field panel, it may be controlled in Slave Mode. Table 5-1 contains Slave Mode point database information.

Overview

Application 650 is one of two FHM applications. Slave Mode is the state of the FHM when it is shipped from the factory. In Slave Mode, the FHM displays “OFF” and the red and green LEDs are OFF. In Slave Mode, the four buttons on the FHM do not have defined functions.

Relay action

In Slave Mode, the contacts of ALARM RELAY (Point 41) will normally be closed. If desired, a field panel can use this relay for local control.

Button action

In Slave Mode, the four buttons are toggle switches (Points 56, 57, 58, and 59). If desired, the field panel can use these buttons. The following table gives examples of toggle switch action:

When...	Then...
the user presses a button	the button status changes from OPEN to CLOSED.
the user presses the same button again	the button status changes from CLOSED to OPEN.

Point database

The following table contains all of the points in Application 650.

Table 5-1. Point Database for Fume Hood Monitor Application 650.

Point Number	Descriptor	Factory Default (SI units)	Engr. Units (SI units)	Slope (SI units)	Intercept (SI units)	On Text	Off Text
1	CTLR ADDRESS	99	--	1	0	--	--
2	APPLICATION	650	--	1	0	--	--
{4}	FACE VEL	--	FPM (MPS)	1	0	--	--
{8}	GEN FAILURE	OFF	--	--	--	ON	OFF
{29}	OCC UNOCC	OCC	--	--	--	UNOCC	OCC
{41}	ALARM RELAY	NORMAL	--	--	--	NORMAL	ALARM
{55}	AUX DI	OPEN	--	--	--	CLOSED	OPEN
{56}	BUTTON 1 (refer to NOTE 3)	OPEN	--	--	--	CLOSED	OPEN
{57}	BUTTON 2 (refer to NOTE 3)	OPEN	--	--	--	CLOSED	OPEN
{58}	BUTTON 3 (refer to NOTE 3)	OPEN	--	--	--	CLOSED	OPEN
{59}	BUTTON 4 (refer to NOTE 3)	OPEN	--	--	--	CLOSED	OPEN
88	CAL RAW	--	--	1	0	--	--
91	BLANK DISP	OFF	--	--	--	ON	OFF
92	DISPLAY RES	10 (0.05)	FPM (MPS)	1	0	--	--
93	ENG UNITS	ENG	--	--	--	SI	ENG
94	LAMP TEST	OFF	--	--	--	ON	OFF
95	DISPLAY WT	100	PCT	0.4	0.0	--	--
{99}	ERROR STATUS (refer to NOTE 3)	0	--	--	--	--	--

1. Points not shown in this table are not used with this application.
2. One value listed in a column indicates that the value is the same in English as it is in SI units.
3. Points represent hardware inputs and are used by the FHM firmware only.
4. Point numbers that appear in brackets { } may be unbundled at the field panel.

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Point Database

Chapter 6 presents a description of the Fume Hood Monitor (FHM) point database including point descriptors, point addresses, and a listing of applications in which each point is found.

Descriptor	Address	Application	Description
CTLR ADDRESS	1	650, 651	Identifies the FHM on the Siemens Building Technologies, Inc. FLN trunk. Valid values: 0 through 31.
APPLICATION	2	650, 651	The identification number of the program operating in the FHM. Valid values are 650 and 651.
FACE VEL	4	650, 651	The calculated average air velocity through the face of the fume hood.
LOW ALM	5	651	This point displays an ON or OFF status to indicate if an alarm condition has occurred. When the face velocity drops below the value specified in the point LOW ALM LIMIT (Point 13) for the time specified in the point ALARM TIME (Point 96), this point goes into an alarm state. The message <code>LOW FACE VELOCITY</code> displays on the LCD and <code>ALARM STATUS</code> changes to <code>ALARM</code> (refer to Point 7).
HIGH ALM	6	651	This point displays an ON or OFF status to indicate if an alarm condition has occurred. When the face velocity rises above the value specified in the point HI ALM LIMIT (Point 10) for the time specified in the point ALARM TIME (Point 96), this point goes into an alarm state. The message <code>HIGH FACE VELOCITY</code> displays on the LCD and <code>ALARM STATUS</code> changes to <code>ALARM</code> (refer to Point 7).
ALARM STATUS	7	651	The common indication of many alarm conditions. Status indicates <code>ALARM</code> if: Low Face Velocity, High Velocity, Emergency (User Alarm), or General Failure are in <code>ALARM</code> , or if the point <code>FACE VEL</code> (Point 4) is failed. For all alarm conditions, the red LED is illuminated, the green LED turns OFF, the alarm horn sounds, and the alarm relay is de-energized.
GEN FAILURE	8	650, 651	Indicates a hardware failure (e.g., velocity sensor) with ON or OFF status. The LCD displays <code>FFF</code> and <code>GENERAL FAILURE</code> . <code>ALARM STATUS</code> changes to <code>ALARM</code> (refer to Point 7).
HI ALM LMT	10	651	This point sets the value, in fpm (m/s), which is used for the High Alarm set point (refer to Point 6).

continued on the next page. . .

Descriptor	Address	Application	Description
LO ALM LMT	13	651	This point sets the value, in fpm (m/s), which is used for the Low Alarm set point (refer to Point 5).
OCC UNOCC	29	650, 651	This point indicates the mode of occupied or unoccupied. When mode is UNOCC, the red LED is ON, the green LED is OFF, and the LCD displays OFF. When the mode is OCC (normal operation), the FHM detects alarms, displays face velocity, and allows the user to initiate an EMERGENCY alarm.
ALARM RELAY	41	650, 651	In NORMAL status, the relay is energized and the contacts are CLOSED (shorted). An alarm will cause the relay to de-energize (no power to the coil) and the contacts will OPEN.
DI FUNCTION	52	651	The value of this point determines the function of AUX DI and AUX BUTTON 2. Values of 1, 2, 3, 4, 11, 12, and 13 enable the following functions: <ul style="list-style-type: none"> 0 No special functions 1 Sash Height Alarm Function 2 High Face Velocity Alarm Disable 3 DI Alarm Point 4 OCC/UNOCC at DI 11 OCC/UNOCC at BUTTON 3 and Function # 1 12 OCC/UNOCC at BUTTON 3 and Function # 2 13 OCC/UNOCC at BUTTON 3 and Function # 3
SASH ALARM	53	651	This point changes from NORMAL to ALARM when the AUX DI has been shorted for the time entered in SASH TIME (Point 54). When in ALARM, the buzzer stays ON for 6 one-second pulses every minute until the AUX DI sash switch is in ALARM again. This point is used only when Point 52 is equal to 1 or 11.
SASH TIME	54	651	The default value for this point is 120. Values of 0–9999 enable this point. When the DI AUX has been shorted for the time specified by this point, the SASH ALARM will indicate ALARM. This point is used only when Point 52 is equal to 1 or 11.
AUX DI	55	650, 651	External digital input used only by the field panel. A shorted input will indicate CLOSED.
BUTTON 1	56	650, 651	The hardware switch input for button 1, which is labeled “Horn Silence.” This is a toggle action switch. For Application 651, this is logically tied to the point HORN SILENCE (Point 61).
BUTTON 2	57	650, 651	The hardware switch input for button 2. This is a toggle action switch. This is logically tied to the point AUX BUTTON 1 (Point 62). This point is available for field panel use.
BUTTON 3	58	650, 651	The hardware switch input for button 3. This is a toggle action switch. This is logically tied to the point AUX BUTTON 2 (Point 63). This point is available for field panel use.
BUTTON 4	59	650, 651	The hardware switch input for button 4, which is labeled “EMERGENCY.” This is a toggle action switch. For Application 651, this is logically tied to the point EMERGENCY (Point 64), the user-activated alarm.

continued on the next page. . .

Descriptor	Address	Application	Description
HORN SILENCE	61	651	<p>Indicates if the first button (labeled “Horn Silence”) has been pressed.</p> <p>If no alarm condition is present, then the state of the point remains at OFF.</p> <p>If an alarm exists, then the horn will silence and the status will change to ON.</p> <p>When the alarm condition clears, the point will reset to OFF.</p>
AUX BUTTON 1	62	651	The hardware input, point BUTTON 2 (Point 57), is logically tied to this point. When the operator presses the point BUTTON 2, the application toggles the status of this output. This point is available for field panel use.
AUX BUTTON 2	63	651	The hardware input, point BUTTON 3 (Point 58), is logically tied to this point. When the operator presses the point BUTTON 3, the application toggles the status of this output. This point is available for field panel use.
EMERGENCY	64	651	Indicates if the fourth (last) button on the FHM has been pressed. This is a toggle action digital input; when pressed, the status of this point is ALARM. If pressed again, then the status of this point is NORMAL. The LCD segment “USER ALARM” will light when the status of the point is ALARM (refer to Point 7).
MIN RAW	71	651	Represents the field calibration min raw reading of the sensor. The min raw reading is found by observing the raw value when the sash is moved to a min calibration sash position.
MID RAW	73	651	Represents the field calibration mid raw reading of the sensor. The mid raw reading is found by observing the raw value when the sash is moved to a mid calibration sash position.
MAX RAW	75	651	Represents the field calibration max raw reading of the sensor. The max raw reading is found by observing the raw value when the sash is moved to a max calibration sash position.
CAL REQUEST	80	651	<p>The installer sets this point to YES to initiate the field calibration procedure. When calibration is complete, the installer sets the point CAL COMPLETE (Point 87) to YES to complete the transfer of entered data into EEPROM.</p> <p>NOTE: Data entered into calibration values is <i>not</i> saved until CAL COMPLETE is set to YES. If the installer starts the calibration procedure and desires <i>not</i> to continue with the calibration, then changing the point CAL REQUEST to NO before changing the point CAL COMPLETE to YES will abort the calibration operation. Calibration data will not be saved.</p>
MAX FVEL	81	651	Represents the field calibration maximum face velocity. The maximum face velocity is found using the portable velocity probe and moving the sash to a maximum calibration velocity position.
MAX DONE	82	651	The person performing calibration toggles this point to save the entered maximum velocity calibration value to EEPROM.

continued on the next page. . .

Descriptor	Address	Application	Description
MID FVEL	83	651	Represents the field calibration mid face velocity. The mid face velocity is found using the portable velocity probe and moving the sash to a mid calibration velocity position.
MID DONE	84	651	The person performing calibration toggles this point to save the entered mid velocity calibration value to EEPROM.
MIN FVEL	85	651	Represents the minimum field calibration face velocity. The minimum face velocity is found using the portable velocity probe and moving the sash to a minimum calibration velocity position.
MIN DONE	86	651	The person performing calibration toggles this point to save the entered minimum velocity calibration value to EEPROM.
CAL COMPLETE	87	651	Changing this point to YES (when CAL REQUEST (Point 81) is set to YES) will complete the field calibration procedure and store the values entered in address Points 81 through 86 into EEPROM. When this point is set to YES, the new calibration values are set and the point CAL REQUEST (Point 80) automatically changes to NO.
CAL RAW	88	650, 651	Raw counts used for diagnostic purposes.
CAL TIME	89	651	The amount of time the FHM samples velocity during a calibration procedure.
BLANK DISP	91	650, 651	When set to YES, the face velocity is not displayed on the FHM.
DISPLAY RES	92	650, 651	A Change Of Value (COV) limit for the face velocity shown on the LCD. The display does not update unless the change in face velocity exceeds this value.
ENG UNITS	93	650, 651	Toggles the display of the FHM from ft/min to m/s. Toggling this point does not affect the displayed value in CIS at the Portable Operator's Terminal.
LAMP TEST	94	650, 651	Turns on all lights, the audible horn, and energizes the alarm relay.
DISPLAY WT	95	650, 651	Factor used to filter out large changes in the value of the point FACE VEL (Point 4), which is displayed on the LCD. This value is a percentage that is used to average a portion of the current average face velocity with a portion of the previous average face velocity. The value of this point is a percentage of the current average face velocity.
ALARM TIME	96	650, 651	Time delay used to detect sudden changes in face velocity and eliminate false alarms. The average face velocity must rise above any of the set limits (e.g., HI ALM LIMIT) for the amount of time specified at this point before the FHM indicates an alarm condition.
DISPLAY MIN	98	650, 651	The value of this point controls the lowest value the LCD will show. Below this value (in fpm or m/s), the display shows zero.
ERROR STATUS	99	650, 651	The status code that indicates any errors detected during FHM power-up. A status of 0 (zero) indicates that there are no problems.

7

Hardware and Software Troubleshooting

Chapter 7 describes corrective measures you can take should you encounter a problem when using a Fume Hood Monitor (FHM) or the Computer Interface Software (CIS). For issues not covered in this chapter, contact your local Siemens Building Technologies, Inc. representative.

Fume Hood Monitor Troubleshooting

You are not required to do any FHM troubleshooting. Contact your local Siemens Building Technologies, Inc. representative if a problem occurs or if you have any questions about the FHM.

NOTE: If a problem occurs, then record what the problem is and what actions were performed immediately before the problem occurred. Being able to describe the problem in detail is important, should you need assistance from your local Siemens Building Technologies, Inc. representative.

Preventive maintenance

Most FHM components are designed so that, under normal circumstances, they do not require preventive maintenance. However, devices that are exposed to dusty or dirty environments may require periodic cleaning to function properly. To ensure optimum system performance, it is recommended that you discuss the operating requirements of your application with your Siemens Building Technologies, Inc. representative to determine the best Technical Support Program for your needs.

Safety features

The circuit board stores the FHM's address, applications, and selected point values. In the event of a power failure or a reset, these values are retrieved from the FHM's permanent memory and are used by the FHM unless overridden by a field panel (if present).

Glossary

Overview

The glossary contains terms and acronyms that are used in this manual. For definitions of point database descriptors, refer to *Chapter 6 - Point Database* in this manual. For definitions of commonly used terms, as well as acronyms and abbreviations associated with APOGEE, refer to the *Technical Glossary of Building Controls Terminology and Acronyms (125-2185)*. This book is available from your local Siemens Building Technologies, Inc. representative.

AI

Analog Input. A physical point that accepts a continuous variable signal.

AO

Analog Output. A physical point that generates a continuous variable signal.

centralized control system

Any building control system.

CFM

Cubic Feet per Minute.

constant volume

Volume of air flowing through the fume hood does not vary.

COV

Change Of Value. A minimum change required to trigger an update of the displayed value.

DI

Digital Input. A physical point that accepts a two-state signal (such as, ON/OFF, OPEN/CLOSED, or YES/NO).

DO

Digital Output. A physical point that generates a two-state signal (such as, ON/OFF, OPEN/CLOSED, or YES/NO).

EEPROM

Electronic Erasable Programmable Read Only Memory. Non-volatile memory.

English units

The foot-pound-second system of units for weights and measurements.

face velocity

Average air velocity through the face of the fume hood.

firmware

Category of memory chips that hold their content without electrical power. Firmware becomes “hard software” when it holds program code.

FLN

Floor Level Network

fpm

Feet Per Minute. A measure of linear air speed.

Fume Hood Controller

Multi-application equipment controller designed to provide Direct Digital Control) for various types of Variable Air Volume (VAV) fume hoods. The controller consists of a controller board and a controller enclosure.

intercept

Factor that converts analog values (used by the FHM) to a form that the user can understand (engineering units). Slope and intercept constants are determined by the type and range of field input/output represented by the physical or virtual point.

LCD

Liquid Crystal Display.

LED

Light Emitting Diode.

Portable Operator's Terminal

Laptop computer used with the CIS to communicate with FHMs.

SI units

Système International d'Unités. The international metric system.

Slave Mode

Default application that comes up when power is first applied to a factory new FHM. No control action is initiated in the Slave Mode.

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