

SIEMENS


Fume Hood Sash Open Area Module (SOAM)


**Application 2957: Dual Bench style –
Dual Combination with 2 to 4 Horizontal
Sashes in the Vertical Carrier
Configuration Start-up Procedures**

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Before You Begin

	⚠ WARNING
	A fume hood is a safety device. Anyone attempting to start up a Fume Hood Controller and its related equipment must have completed Operations Training.

	⚠ WARNING
	DO NOT connect to the USB port of the SOAM while the fume hood is in operation.

At the job site, locate the major control system and the mechanical and electrical drawings. This should include any components working in conjunction with the Sash Open Area Module (SOAM).

Verify that the SOAM input/output (I/O) points are wired per the installation instructions.

Verifying Power

1. Verify that the controller has 24 Vac power and that the fuse has been inserted into the trunk or that power to the transformer is ON.
2. Verify the RUN LED is green.
If any error condition exists the LED is solid red. If no error condition exists, then the LED is solid green when not communicating and flashing 80-20 when communicating.

Installing USB Driver

1. Open Windows Explorer and navigate to **Standard Apps**.
2. Find the USB device/drive
(VCP_V1.3.1_Setup.exe/VCP_V1.3.1_Setup_x64.exe) in the drives list.
3. Double-click the appropriate executable to launch the application. Follow the on screen instructions.
4. Plug in the USB on both ends (the device side to the Sash Aggregator; the host side to the computer).

Verifying Slave Mode Application

- Open WCIS and verify that Application 2950 (Slave Mode) is running at the controller.



NOTES:

Only WCIS 4.1 or higher is compatible with this device.
In order to save configuration values, you must either change WCIS settings (select Write to EEPROM only) or double-click a subpoint to open a dialog box.

Setting Controller Address

1. If using the sensor bus to communicate the face area:
Verify CTLR ADDRESS is correct (default is 51 and does not need to be changed).

Setting the Application

1. Select the desired application.
 - 2950 – Slave Mode
 - 2951 – Bench style fume hoods – 4 independent vertical sashes
 - 2952 – Floor Mounted style fume hoods – 2 independent sets of 2 vertical sashes, one on top of the other
 - 2953 – Dual – Floor Mounted style fume hoods – 4 independent sets of 2 vertical sashes, one on top of the other
 - 2954 – Bench style fume hoods – 2 to 10 horizontal sashes
 - 2955 – Bench style fume hoods – 1 vertical carrier with 2 to 9 horizontal sashes
 - 2956 – Floor Mounted style fume hoods – 2 vertical sashes, with top sash having 2 to 8 horizontal sashes
 - 2957 – Dual Bench style fume hoods – 2 vertical carries (non-overlapping) each with 2 to 4 horizontal sashes in the vertical carrier
 - 2958 – Floor Mounted style fume hoods – 2 vertical sashes (overlapping), with each sash having 2 to 4 horizontal sashes

Setting Units



NOTE:

All measurements entered during the start-up sequences can either be English or SI values (listed in parentheses after the English unit), depending on which unit type is selected, using the **Metric/English Units** button, in the appropriate tool.

Fume Hood Specific Sash Setup and Calibration

This section presents the steps for calibrating the Fume Hood Sash Open Area Module sash sensors and configuring the face area parameters.

Sash Setup and Calibration

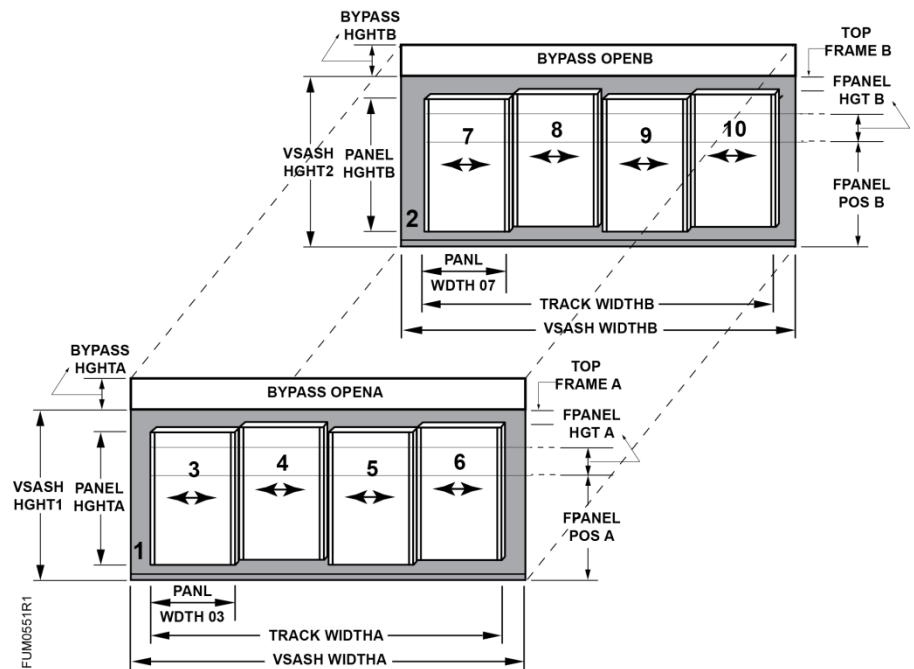


NOTE:

Enter all measurements to the nearest .025 inch (0.635 cm).

Sash Setup 2957

1. Set REPORT to OVERVIEW.



Nine Combination Sash Configuration.

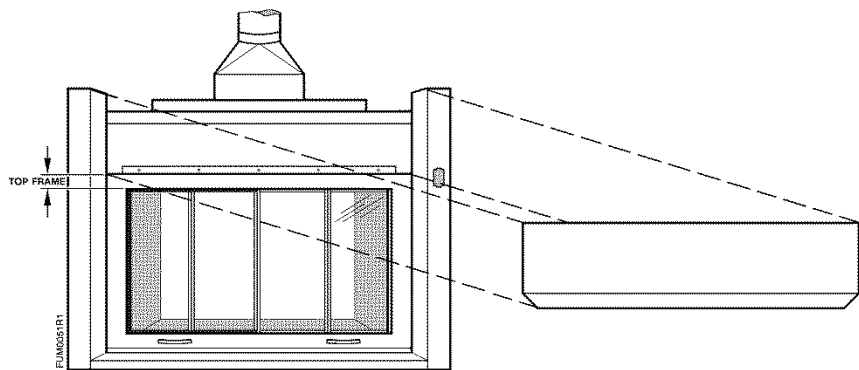
NOTES: Numbers on the sashes show how the sash is wired. After the physical sashes are calibrated, the position of the sashes will display in POS SASH 1, POS SASH 2, and so on.

The horizontal sash numbering in vertical sash 2 always starts with 7. For example, if HZ PANEL CNT = 4, then vertical sash 1 contains sashes 3 and 4 and vertical sash 2 contains sashes 7 and 8.

2. Determine the number of horizontal sash panels. This number includes the horizontal sashes in both combination sashes. The segments must contain the same number of horizontal sashes. Set HZ PANEL CNT to this value.
3. Measure the width of the vertical sash 1 in inches (cm). Set VSASH WIDTHA to this value.
4. Measure the width of the opening in vertical sash 1 in inches (cm). Set TRACK WIDTHA to this value.
5. Measure the height of the opening in vertical sash 1 in inches (cm). Set PANEL HGHTA to this value.
6. Repeat steps 2 through 5 for vertical sash 2. Enter the values into VSASH WIDTHB, TRACK WIDTHB and PANEL HGHTB.
7. Measure the width of the individual sash panels in inches (cm). Choose one of the following:

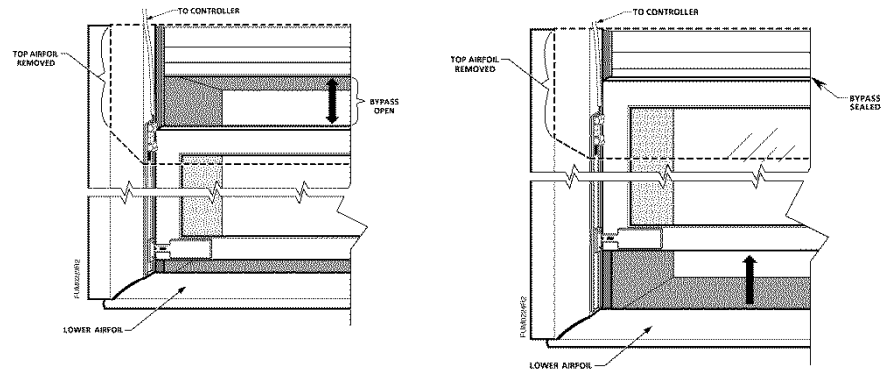
NOTE: If segment A and segment B dimensions are the same, only setup segment A.

- If all the sash panels in both segments are the same width, set PANL WPTH 03 to this value.
 - If all even horizontal panels are one size and all odd horizontal panels are another size.
 - a. Set PANL WPTH 03 to the width of the odd sashes.
 - b. Set PANL WPTH 04 to the width of the even sashes.
 - If all panels are different sizes.
 - a. Set PANL WPTH 03 to the width of sash 3.
 - b. Set PANL WPTH 04 to the width of sash 4.
 - c. Set PANL WPTH 05 to the width of sash 5.
 - d. Repeat until all sashes are defined.
- 8.** Measure the height of the top frame of sash 1 in inches (cm). The sash frame holds the horizontal sash panels and occupies the outer edges of the fume hood opening. Set TOP FRAME A to this measured value.



Top Frame Measurement with Air Foil Removed.

- 9.** Open sash 1 until the top edge of the vertical sash is aligned with the top edge of the bypass area. Measure the height of the sash opening in inches (cm). Set BYPASS HGHTA to this value.

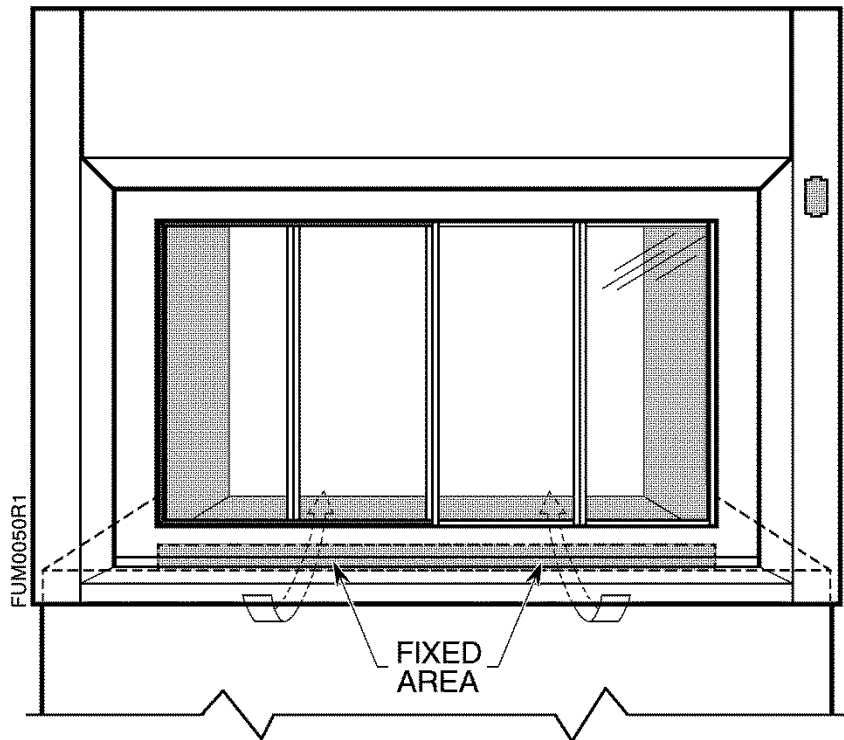


Vertical Sash Fume Hood with Bypass Area Open and Closed.

10. If there is no restriction on the bypass, leave **BYPASS OPEN** at the default (100%). If the bypass area has an airflow restrictor covering the open area, such as a perforated grille or louvers, estimate the open percentage of the bypass area. Set **BYPASS OPEN** to the appropriate value.
11. Repeat steps 8 through 10 for vertical sash 2. Enter the values into **TOP FRAME B**, **BYPASS HGHTB**, and **BYPASS OPENB**.
12. Measure the height of vertical sash 1 in inches (cm). Set **VSASH HGHT1** to this value.
13. Measure the height of the vertical sash 2 in inches (cm). Set **VSASH HGHT2** to this value.
14. Measure the fixed area of the fume hood in square feet (square meters). Any fume hood leakage must be accounted for in this measurement. Set **FIXED AREA** to this value.

NOTE: The fixed area of the fume hood is an area that remains open regardless of sash position or movement. For example, most fume hoods have an intake gap under the lower airfoil and above the cabinet of the fume hood (typically a 1 inch gap). Also include 1% of the maximum open face area in this calculation for other open areas, such as the space between the sash and the track, and leakage.

15. If the fume hood has a fixed panel in the sash opening of Segment A, locate the position of the panel by measuring from the bottom of the sash opening to the bottom of the fixed panel and enter the value into **FPANEL POS A**. Measure the height of the fixed panel and enter the value into **FPANEL HGT A**. Repeat step 15 for Segment B.



NOTE: ↗ WHITE ARROWS INDICATE AIR FLOW THROUGH FIXED AREA.

Example Combination Sash Fume Hood with Fixed Area.

Sash Calibration



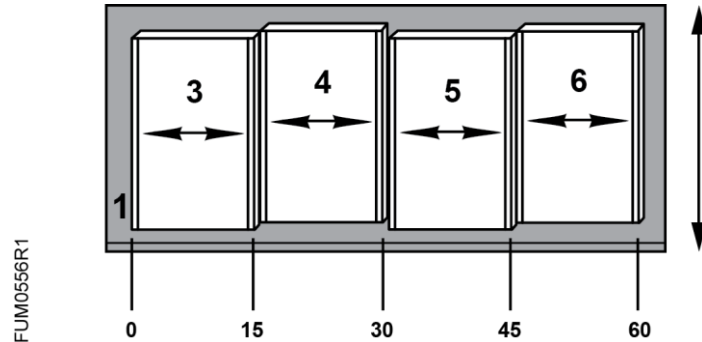
NOTE:

It is recommended that the vertical sash be calibrated before the horizontal sashes.

Starting with the first side, side A.

1. Set CAL SASH NUM to 1. It is recommended that the vertical sash be calibrated before the horizontal sashes.
2. Set CAL SASH LOC to **MIN** for minimum opening.
3. Slide the vertical sash to the closed position. Set CAL SASH POS to 0 unless a physical stop prevents the sash from fully closing. If a physical stop is present, measure the distance from the lower end of the vertical track to the bottom of the sash in inches (cm). Set CAL SASH POS to this value. When the sash aggregator accepts the reading, the minimum position value will be automatically entered into POS SASH 1.
4. Set CAL SASH LOC to **MAX** for maximum opening.
5. Slide the vertical sash to the open position. Measure the distance from the lower end of the track to the bottom edge of the sash panel in inches (cm). Set CAL SASH POS to this value. When the sash aggregator accepts the reading, the maximum position value will be automatically entered into POS SASH 1 and CAL SASH POS will revert back to 257.

6. Set CAL SASH NUM back to **0** or to the number of the horizontal sash panel to be calibrated (sashes 3 through 6). This locks to sash calibration into the sash aggregator.
7. Set CAL SASH LOC to **MIN** for minimum opening.
8. Slide the sash panel to be calibrated to the far left. Measure the distance from the left end of the track to the left edge of the sash panel. Set CAL SASH POS to this value. When the sash aggregator accepts the reading, the minimum position value will be entered into POS SASH 3.



Sash Panel Measurement (15-inch Sash Panels).

9. Set CAL SASH LOC to **MAX** for maximum opening.
10. Slide the sash panel to be calibrated to the far right. Measure the distance from the left end of the track to the left edge of the sash panel. Set CAL SASH POS to this value. When the sash aggregator accepts the reading, the maximum position value will be entered into POS SASH 3.
11. Set CAL SASH NUM to **0** or to the next number of the horizontal sash panel to be calibrated. This locks to sash calibration into the sash aggregator.
12. Repeat Steps 7 through 11 for the remaining sash panels.
13. Repeat all steps for the second side of the hood, side B. The vertical sash will be POS SASH 2 and the horizontal sashes will be POS SASH 7 through POS SASH 10.

Sash Calibration Verification

1. Close the vertical sash fully and verify that the value displayed at POS SASH 1 is at the minimum that was set during calibration. Open the sash half way and verify that the value displayed at POS SASH 1 is equal to the measured value. Open the sash fully and verify that the value displayed at POS SASH 1 is at the maximum that was set during calibration. See Table *Sash/Point Wiring*.
2. Repeat this verification procedure for the second vertical sash panels using the appropriate corresponding points. See Table *Sash/Point Wiring*.
3. Slide the horizontal sash panel 3 to the left and verify the value displayed at POS SASH 3 is at the minimum that was set during calibration. Slide the sash to the middle of its range and verify that the value displayed at POS SASH 3 is equal to the measured value. Slide the sash to the right and verify that the value displayed at POS SASH 3 is at the maximum that was set during calibration. See Table *Sash/Point Wiring*.
4. Repeat this verification procedure for the remaining sash panels using the appropriate corresponding points. See Table *Sash/Point Wiring*.

Sash Point/Wiring.		
Sash Panel	Point	Descriptor
Vertical 1	31	POS SASH 1
Vertical 2	32	POS SASH 2
Horizontal 3	33	POS SASH 3
Horizontal 4	34	POS SASH 4
Horizontal 5	35	POS SASH 5
Horizontal 6	36	POS SASH 6
Horizontal 7	37	POS SASH 7
Horizontal 8	38	POS SASH 8
Horizontal 9	39	POS SASH 9
Horizontal 10	40	POS SASH 10

Setting External Face Area Input

Skip this section if you are only using one SOAM, leave values at default.

AI can be set up as an input for external face area.

1. Set MAX EXT AREA to the area corresponding to 10 volts from the input signal source.
 - ⇒ The next step allows the minimum voltage to be set to a value other than 1 (default). The minimum voltage is represented when the face area is equal to 0.
2. Set MIN EXTVOLTS to the voltage corresponding to 0 face area from the input signal source. (default = 1.0 Vdc)
 - ⇒ The resulting area displays in point EXTERNAL A.



NOTE:

If no external area input is connected to the AI, make sure MAX EXT AREA = 0 (default). This disables the alarm feature that fails the FACE AREA point when the input signal drops below 1 Vdc.

Setting Face Area Output Range

1. Set REPORT to **FACE AREA OUT**.
2. Set MAX FACE A to the maximum expected face area for the fume hood, plus approximately 10%. Example: If the maximum face area is 9 sq ft, set it to 10.
 - ⇒ FACE A OUT is now active and a proportional 1 to 10V signal can be read on AO. 1V equals 0 sq ft and 10V = MAX FACE A.
3. Set AO DEADBAND to the desired value.



NOTE:

AO DEADBAND can be set from 0 to 100% in 0.4% increments. 0% will give the actual face area all the time. If a sash input signal is unstable, this will cause an unstable reading to be sent to the output which could cause short-term instability or control problems. Increase the values to give a stable output and remove the signal bounce. A 10% deadband is equal to a $\pm 5\%$ of the face area.

AO DEADBAND defaults to 0%. If FACE A OUT changes by less than the percentage value in AO DEADBAND, the output will not update. Once the value changes greater than the AO DEADBAND, the output will be updated to the currently calculated value.

- If needed, set MIN FA VOLTS (default = 1 Vdc).

MIN FA VOLTS can be left at default for most installations. Changing this value changes the voltage output when the FACE AREA = 0 sq ft.



NOTE:

If the MIN FA VOLTS is set to 0, failure detection is lost.

Flashing Controller Firmware

WCIS Procedure

1. Connect to the USB port of the SOAM.
2. From the **Device** menu, select **Load TEC Firmware**.
⇒ The **Load TEC Firmware** dialog box displays.
3. Click the **Browse** button.
4. Browse to the folder where the new firmware is saved.
5. Double-click the firmware file and then click **Load**.

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