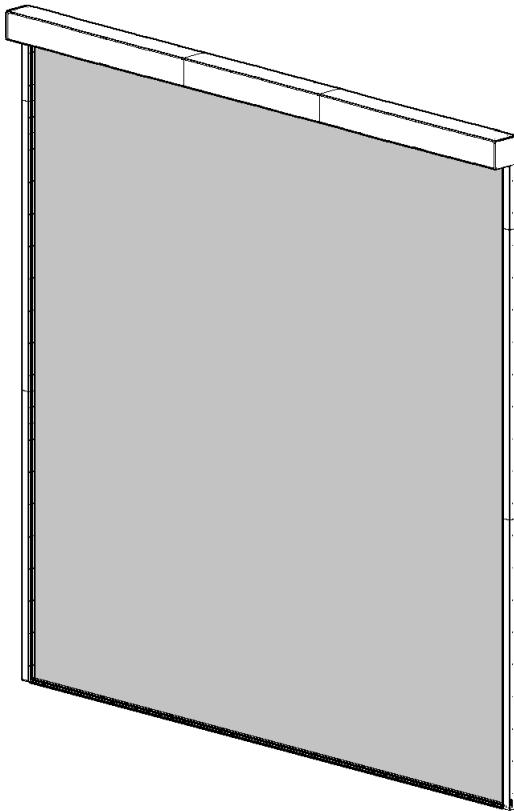




# *fire+smoke* CURTAINS

## **Operation & Maintenance Manual**

for Model 2500 Smoke and Fire+Smoke systems from Smoke Guard, Inc.



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Call your local Smoke Guard distributor  
for answers to questions about your system

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# **Introduction**

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This is the official operation, maintenance, and testing manual for the Model 2500 Smoke and Model 2500 Fire+Smoke curtains from Smoke Guard, Inc.

NOTE: Read this entire manual before operating, maintaining or testing your Smoke Guard system.

The Smoke Guard Model 2500 Fire+Smoke system is a code compliant, 2 hour (120 minute), Fire Endurance rated curtain and complies with the UL 10D standard. It is also rated to UL 1784 according to the requirements of smoke and draft control assemblies defined in NFPA 105.

The Smoke Guard Model 2500 Smoke system is a code compliant smoke-rated assembly that is designed to protect openings in smoke-rated construction. It is also rated to UL 1784 according to the requirements of smoke and draft control assemblies defined in NFPA 105.

The M2500 is designed to be installed into the building structure with the main housing located at ceiling level and guides mounted to each wall of the opening to be protected. The main housing contains a smoke or fire rated curtain stored around a curtain tube. During normal operation and under alarm conditions, the curtain unwinds from the tube towards the floor.

Guides at each side maintain pressure sealing. The descent of the curtain is normally regulated by a DC motor at an average of at least 6 inches per second. The curtain will also deploy entirely by gravity in the event of power loss. The M2500 controller will interface with a smoke detector or fire alarm circuit. The controller also controls the DC motor and brake, which deploy and retract the curtain. Battery backup power ensures operation in the event of AC power loss.

As with other components of your fire protection system, periodic maintenance is required. The building owner must inspect and test each Smoke Guard unit at least once every six months. Failure to properly test and maintain your Smoke Guard unit could result in death or serious injury in the event of a fire.

# **The responsibilities of the building owner**

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The Smoke Guard system is considered “connected equipment” as defined in NFPA 72. As such, the owner or designated representative shall be responsible for inspecting, functional testing, recording of tests, and maintaining the system. Delegation of responsibility shall be in writing, with a copy made available to the authority having jurisdiction under the provisions of the building code and local ordinances.

## ***Testing frequency***

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Visual inspection, functional testing, and maintenance described in this manual must be performed and recorded at intervals not longer than six months, more frequently where required by the authority having jurisdiction.

## ***Alterations and additions***

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Visual inspection shall ensure that there are no changes that would affect equipment performance—such as building modifications, occupancy hazards, and environmental effects. Smoke Guard recognized personnel must perform any alterations or additions to your system.

## ***System acceptance testing***

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Acceptance tests shall be performed after system components are added or deleted, after any modification, repair, or adjustment to the system hardware or wiring.

# Operation

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The following topics explain the function of your M2500 Smoke Guard system.

## ***What makes up the Model 2500 Smoke Guard system***

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**Housing:** The M2500 consists of a smoke-rated or fire+smoke-rated fabric curtain assembly mounted within a steel housing. The housing contains a tubular motor (systems over 20 feet in width have 2 motors), drive components, system electrical sensors, and curtain.

A junction box within the housing receives wiring from the main controller and distributes it to the motor/brake assembly as well as switches.

**Guide system:** The curtain is captured vertically on both sides by curtain loops secured by guide rods. The guide rods thread through guides anchored at each side of the system. Guides can be mounted on a wall face, recessed into pockets or mounted within an opening jamb. The curtain deploys within a continuous vertical slot in each guide.

**Curtain:** The curtain assembly is equipped with a bottom bar to seal the curtain at the bottom and optional sensing edge to detect obstructions to the deploying screen.

**Controller:** The main controller houses terminal blocks to receive main power, a 24Vdc power supply, controller PCA, batteries and terminal blocks to interface with curtain and building connections. It also contains a user interface PCA, which has three indicator LEDs, and a test deploy switch. The system is powered by an input source supplying 100-240VAC 50/60Hz. A 24VDC power supply provides power for the entire curtain system. Two 12V sealed lead-acid batteries provide power should the primary power be lost.

**Door activation switches:** Optional door activation switches, installed on the right as occupants approach the curtain from either side, allow occupants to temporarily raise a deployed curtain approximately 7 feet in order to pass through.

**Keyed test-deploy switch.** An optional keyed wall switch simulates an alarm condition and is provided to facilitate testing. (NOTE: There is also a test-deploy switch on the main controller near the user-interface LEDs.)

NOTE: The smoke detector or other initiating device is part of the building smoke and fire alarm system and NOT a component of the Smoke Guard system. However, it is an essential component, vital to the proper operation of the system and all other connected equipment. The smoke detecting system must therefore be inspected, tested, and properly maintained in accordance with the equipment manufacturer's guidelines as well as the requirements of the authorities having jurisdiction. Emergency power to the smoke detector should be maintained in accordance with NFPA 70.

## ***How the Smoke Guard system works***

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**Ready:** The system connects to an auxiliary relay in the smoke detector located in the lobby ceiling. The curtain is rolled up and concealed within the housing.

**Alarm:** When the local smoke detector goes into alarm, the curtain deploys, stopping when it reaches the floor. A bottom bar along the bottom of the curtain creates a seal at the floor when the curtain is fully deployed. If equipped with an optional sensing edge and there is an obstacle in the path of the curtain, it stops after one attempted re-deployment. Remove the object and the curtain re-deploys if alarm conditions continue to exist.

**Deployed:** When the unit is deployed, it remains deployed until the smoke detector clears. The curtain may bow slightly in or out due to differential pressure.

Optional door activation switch: For units equipped with these switches, someone requiring passage through an opening where the curtain is deployed can press this switch (mounted to the right side of the curtain as approached from either side) and the curtain retracts temporarily. The curtain then re-deploys if alarm conditions still exist; otherwise, the curtain retracts fully and remains in ready mode.

**Retract:** The curtain retracts automatically when the smoke detector clears. (Pressing one of the optional door activation switches retracts the curtain only temporarily while an alarm condition exists.) If a considerable differential pressure has developed across the curtain the motor may overcurrent due to the additional load. In this situation the controller will pause and attempt 4 times to retract, giving time for the pressure to dissipate.

**Input/output signal monitoring:** The controller monitors the integrity of various subsystems. If the controller should detect any anomalies during operation an audible alarm will sound and reports the problem via three status LEDs on the outside of the controller.

Status LED flash code—LED flash patterns visible from the outside of the control box identify the system fault. Refer to the appendix in this document "Appendix: Troubleshooting a System Fault" at the end of this document to determine the fault and appropriate corrective action.

If the issue cannot be resolved, notify an authorized service representative or contact Smoke Guard at 800-574-0330.

### ***What to do if the curtain has deployed***

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The curtain should only deploy if the smoke detector goes into alarm. If equipped with optional door activation switches, after the curtain deploys press one of the switches to retract the curtain temporarily. If the smoke detector is still in an alarm state, the curtain then redeploys. After the smoke detector clears, the curtain retracts automatically. If mains power is lost the curtain will deploy and retract on battery power if the smoke detector goes into alarm.

If a unit deploys during a fire, notify Smoke Guard (800-574-0330) for a free service visit.

# **Maintenance/Testing**

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The following topics cover the requirements for testing, inspecting, and maintaining your Smoke Guard system.

## ***Before you test***

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NOTE: These instructions assume that installation is complete and the installer has conducted the tests specified in the installation manual to verify proper installation.

Prior to testing, complete the following tasks:

- Review the information regarding the system included in this manual.
- Notify anyone who might receive an alarm.
- Notify building occupants.

## ***Functional test and visual inspection***

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A functional test involves triggering the local smoke detector, observing the deployment of the system, retracting the curtain, and re-calibrating if necessary. Locate the service record at the back of this manual and fill it out as you proceed. You are responsible for reporting any required adjustments to Smoke Guard or your installing distributor.

1. Locate the status LEDs on the outside of the control box and verify that the system is in standby state by the presence of one continuously-lit, green LED. (If all LEDs flash sequentially, the system is running a normal system check.)
2. Activate the smoke detector or other initiating device connected to the unit per manufacturer's recommendations.
3. Observe curtain deployment to ensure smooth motion. If motion is jerky, check the guides for obstruction.
4. While deployed, verify that there is one continuously-lit, green LED on the control box indicating successful deployment.
5. Visually inspect the curtain assembly for damage to the curtain material or bottom bar at the floor. If any damage is present, immediately contact Smoke Guard or local distributor for repair procedures.
6. Retract the curtain by clearing the smoke detector.
7. Observe curtain retraction to ensure smooth motion.
8. Again, verify that the system is in standby state by the presence of one solid green LED. (If all LEDs flash sequentially, the system is running a normal system check.)

**If there is an optional door activation switch:**

9. Activate the smoke detector a second time to deploy the system.
10. Press the door activation switch. The curtain should retract approximately 7 feet, pause, and re-deploy.
11. If present, press the other door activation switch. The curtain should retract approximately 7 feet, pause, and re-deploy.
12. Verify that the system is in standby state by the presence of one solid green LED. (If all LEDs flash sequentially, the system is running a normal system check.)
13. Retract the curtain by clearing the smoke detector.

# **Record Keeping**

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The following topics explain how to maintain a record of the tests that you perform on your Smoke Guard system:

- Why keep records?
- What records should be kept?

## ***Why keep records?***

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According to NFPA 72 (2002 edition), the building owner is responsible for keeping the maintenance and testing record for the life safety devices in their building. Records should be kept available for examination by any authority having jurisdiction upon request.

## ***What records should you keep?***

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A permanent record of all inspections, testing, and maintenance shall be retained by the building owner, including all the information below:

- test date
- name of person performing inspection, maintenance, and/or tests
- functional test of smoke detectors signaling the system per NFPA 72
- location of M2500
- any modifications or alterations made to the system
- name and signature of the tester

# **Mandatory Semi-Annual Cycle Test**

## **Appendix: Troubleshooting a System Fault**

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If the curtain fully deploys on its own (fall-by-gravity) this indicates that it has completely lost power: main power is off and the battery backup voltage has dropped below a critical threshold. If the controller is emitting a steady audible alarm the system is in a fault state. Refer to the sections below.

### ***System fault annunciation***

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If one of the system-monitored input/output signals becomes abnormal, the control module enters a fault state, warning that system functionality may be compromised. The controller will emit a steady audible alarm. Further information is displayed through flashing LED patterns viewed from the right side of the controller. All flashing LED patterns are provided below as well as recommended corrective action.

### ***Clearing a system fault***

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Clear a system fault by pressing, with a small probe, the test deploy switch located on the front of the controller adjacent to the indicator LEDs. Pressing this switch once will silence the audible alarm and the system will remain in a fault state. In order to clear a system fault, first correct the problem (see "Recommended Correct Action" page 14) and then press the test deploy switch again to attempt to clear the fault. If successful, the fault is cleared and the system remains in the ready state. If the problem persists, the system will continue to indicate the error with the audible alarm and the flashing LED pattern. If the audible alarm is silenced but the fault is not cleared the audible alarm will be reactivated after 4 hours to remind personnel that the problem persists.

## M2500 Status LED interpretations

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State	Description	GREEN Status	YELLOW Fault Code	RED Trouble	Notes
Normal 1	System OK	ON	OFF	OFF	System fully functional.
Normal 2	Power on/ Self test active	Sequential Flash	Sequential Flash	Sequential Flash	Approximately 12 seconds to complete.
Normal 3	System in calibration	1-Blink on .5S Off 5 S	1-Blink on .5 S Off 5 S	OFF	
Normal 4	LAS active	ON	1-Blink on .5 S Off 5 S	OFF	Normal operation with Full deploy.
Normal 5	FSCS Close or Open active	ON	2-Blink on .5 S Off 5 S	OFF	Normal operation with deploy in accordance with FSCS request.
Normal 6	No AC, battery active	1-Blink on .5S Off 5 S	OFF	1-Blink on .5 S Off 5 S	Power supply problem or main power off, running on battery.
Error 1	Battery Health Low/Critical	OFF	1-Blink on .5 S Off 5 S	ON	Batteries low or controller charging problem.
Error 2	Obstruction or out of calibration	OFF	2-Blink on .5 S Off 5 S	ON	If error occurs on power-up then out of calibration.
Error 3	LAS open circuit	OFF	3-Blink on .5 S Off 5 S	ON	No EOL detected.
Error 4	Moving up or down timeout	OFF	4-Blink on .5 S Off 5 S	ON	Motor, controller or limit switch problem.
Error 5	Up Limit Switch open/short circuit	OFF	5-Blink on .5 S Off 5 S	ON	Up limit switch not in correct state at start of curtain travel.
Error 6	Motor over-current	OFF	6-Blink on .5 S Off 5 S	ON	Motor stopped due to excessive current draw.
Error 7	Edge Sensor fault	OFF	7-Blink on .5 S Off 5 S	ON	Edge sensor transmitter/receiver fault. Most likely dead batteries.
Error 8	Slave Controller Fault: Overcurrent	OFF	8-Blink on .5 S off 5 S	1-Blink on .5 S off 5 S	Slave controller(s) stopped due to overcurrent.
Error 8	Slave Controller Fault: AC Off	OFF	8-Blink on .5 S off 5 S	2-Blink on .5 S off 5 S	Slave controller(s) has lost AC power and master has not.
Error 8	Slave Controller Fault: Battery	OFF	8-Blink on .5 S off 5 S	4-Blink on .5 S off 5 S	Slave batteries low or controller charging problem.
Error 9	Brake fault	OFF	9-Blink on .5 S Off 5 S	ON	Curtain will fall by gravity due to failed brake.

## Notes on status LED interpretations

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1. System status LED (green) is normally on solid and changes to blink once per 5 seconds when running on the battery.
2. Fault LED (yellow): Blinks for fault conditions when the RED led # 2 is on solid. This LED will be off and then blink on for brief periods (1/2 second for the number of times indicated). It will then repeat this sequence after a delay of 5 seconds in between.

3. Trouble LED (red): Is solid during a fault condition unless the system is configured with a Master/Slave controller combination. If there is an Error 8 (8 blink yellow) the Trouble LED will additionally blink a fault code pertaining to the slave fault condition.

### ***Recommended corrective action***

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**Error 1—battery health is low:** Verify battery electrical connectors are secure within the controller housing. Replace batteries if faulty (combined battery voltage measures less than 24.5VDC).

**Error 2—obstruction or out of calibration:** If the system has not been calibrated, this error will appear at power-up. Perform a calibration to clear the fault. If the system is equipped with a leading edge sensor this error will indicate that an obstruction has been detected. Check for an obstruction or misalignment.

**Error 3—local alarm system open circuit:** The local alarm system, whether a smoke detector or fire alarm, requires an end-of-line (EOL) diode, provided by Smoke Guard, installed at the normally open contacts of the device. This error will occur if the diode is not connected or is faulty, or if the wiring between the diode and controller is interrupted.

**Error 4—moving up or down timeout:** Indicates that movement was not detected when the system was deploying or retracting. Ensure that the curtain is not blocked or jammed. If it is observed that the curtain did actually move, it is likely that the motor position sensor is faulty. If no movement is observed, then there is potentially a faulty motor or controller. Notify the local distributor or Smoke Guard at 800-574-0330.

**Error 5—up limit switch fault:** Indicates the controller is not sensing the operation of the up limit switch. Operation of the up limit switch can be verified by manually toggling the switch and listening at the controller PCA for a relay click (one of the orange rectangular blocks on the circuit board.) Notify the local distributor or Smoke Guard at 800-574-0330.

**Error 6—motor overcurrent:** The motor has drawn an excessive amount of current. Check system alignment and blockage. This could also represent faulty motor or wiring. Notify the local distributor or Smoke Guard.

**Error 7—sensing edge fault:** If the system is equipped with a leading edge sensor, this fault most likely means that the batteries in the edge sensor transmitter need to be replaced. The transmitter is located on a bracket attached to the curtain bottom bar. Perform the following procedure:

- 1) Press the TDS once to silence the alarm.
- 2) Press the TDS a second time to temporarily clear the Error 7 fault.
- 3) Immediately press the TDS a third time to deploy the curtain.
- 4) With the curtain deployed, remove the edge sensor transmitter from the curtain bottom bar and replace the two AA batteries within the housing. Reinstall the transmitter.
- 5) Press the TDS to retract the curtain.
- 6) Verify that the Error 7 does not reappear after a period of 20 seconds.

If the fault persists after battery replacement then notify the local distributor or Smoke Guard at 800-574-0330.

**Error 8—slave controller fault:** If the M2500 is a two motor system (curtain width >20 feet) then there is an additional slave controller mounted adjacent to the main controller. If the main controller reports this error the red LED additional blinks a slave fault code:

1-Blink Overcurrent: The slave motor has drawn excessive current. See Error 6 above.

2-Blink AC Power: The slave controller has lost AC power but the master has not. Verify whether the slave controller is on a different power circuit than the master that may have been turned off. If the problem persists notify the local distributor or Smoke Guard.

4-Blink Battery: There is an issue with the slave controller batteries. See Error 1 above.

**Error 9—brake fault:** The M2500 uses an electromechanical brake to hold the curtain in the retraced state. If this brake fails the curtain will fall by gravity. The controller will recognize this situation and report a brake fault. Attempt to clear the fault by pressing the TDS twice: once to silence the alarm and once to retract the curtain. If the curtain will not remain retracted notify the local distributor or Smoke Guard.

