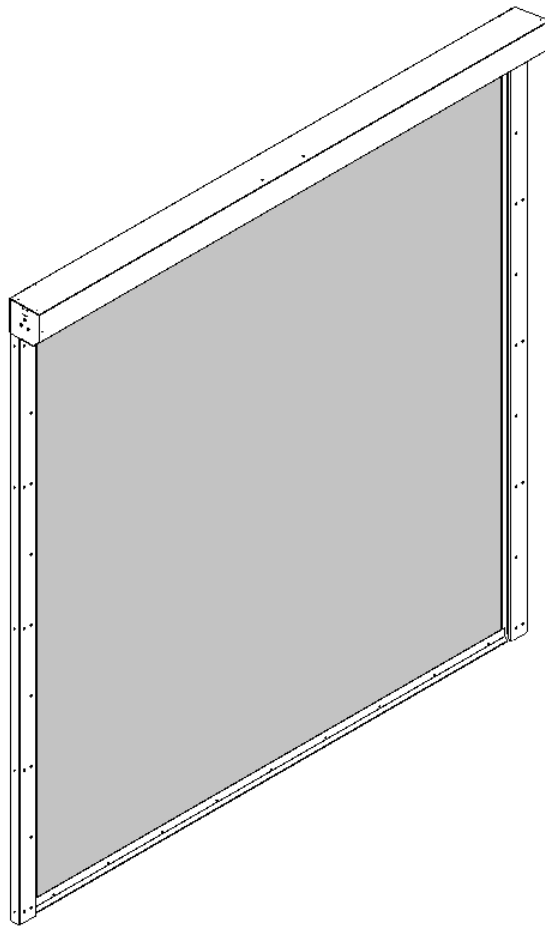




Operation & Maintenance Manual

for Model 2100 Fire+Smoke systems from Smoke Guard, Inc.



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Introduction

This is the official operation, maintenance, and testing manual for the Model 2100 Smoke and Model 2100 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 2100 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 M2100 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 M2100 controller will interface with a smoke detector or fire alarm circuit. The controller also controls the DC motor, 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

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

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

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

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

The following topics explain the function of your M2100 Smoke Guard system.

What makes up the Model 2100 Smoke Guard system

Housing: The housing consists of curtain assembly mounted within a steel housing with tubular motor and drive components.

Guide system: The curtain is captured vertically on both sides by guides. 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 is made of a smoke-rated or fire+smoke-rated fabric and is equipped with a bottom bar to seal the curtain at the floor.

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. An optional dual system controller configuration contains an additional controller PCA and terminals to control a second independent curtain system.

Door activation switches: Optional door activation switches, located on the right as occupants approach the curtain from either side, allow occupants to rewind the curtain temporarily by pressing the switch.

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

Ready: The system connects to an auxiliary relay in the smoke detector located nearby. 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.

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 the optional curtain retract switch retracts the curtain only temporarily while an alarm condition exists.)

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

The curtain should only deploy if the smoke detector goes into alarm. If equipped with an optional door activation switch, press the switch to rewind the curtain temporarily. If alarm conditions continue to exist, the curtain re-deploys. After the smoke detector clears, the curtain retracts automatically. If the unit loses power for a period exceeding the capacity of the integral battery backup system (approximately 15 hours) the curtain will remain deployed until main power is restored.

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

Maintenance/Testing

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

Before you test

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

A functional test involves triggering the local smoke detector, observing the deployment of the system, and retracting the curtain. 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 the distributor who installed the unit.

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, pause, and re-deploy.
11. If present, press the other door activation switch. The curtain should retract, 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

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?

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?

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 M2100
- any modifications or alterations made to the system
- name and signature of the tester

Mandatory Semi-Annual Cycle Test

Date	Location	Smoke detector	Curtain	Modifications	Inspector's name	Inspector's signature

Appendix: Troubleshooting a System Fault

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

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

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 the test deploy 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.

Dual System Controller Configuration

The Dual System Controller contains two independent control systems within one housing with connections to control two independent curtains. There is a shared common power supply but otherwise the systems function separately. There is an indicator LED/test deploy switch interface for each system. The troubleshooting procedures below apply equally to each system.

M2100 Status LED interpretations

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 .5 S Off 5 S	1-Blink on .5 S Off 5 S	OFF	
Normal 4	LAS active	1	1-Blink on .5 S Off 5 S	OFF	Normal operation with Full deploy.
Normal 5	No AC, battery active	1-Blink on .5 S Off 5 S	OFF	1-Blink on .5 S Off 5 S	Low voltage power supply or main power off, running on battery.
Error 1	Battery Health Low/Critical	OFF	1-Blink on .5 S Off 5 S	ON	Battery low or controller charging problem.
Error 2	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 timeout	OFF	4-Blink on .5 S Off 5 S	ON	Motor, controller or limit switch problem.
Error 5	Motor over-current	OFF	5-Blink on .5 S Off 5 S	ON	Motor stopped due to excessive current draw.
Error 6	Edge Sensor fault	OFF	6-Blink on .5 S Off 5 S	ON	NOT IMPLEMENTED
Error 7	Braking fault	OFF	7-Blink on .5 S Off 5 S	ON	Curtain will fall by gravity due to failed braking action.

Notes on status LED interpretations

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.

Recommended corrective action

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—out of calibration: If the system has not been calibrated, this error will appear at power-up. Perform a calibration to clear the fault.

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—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 6—edge sensor fault: Currently not implemented.

Error 7—braking fault: The controller uses the motor to hold the curtain in the retracted position. If the controller determines that the curtain has moved downward while it was supposed to be retracted, it assumes the braking action of the motor has failed. If the problem persists then notify the local distributor or Smoke Guard.

