



Model SF 503A Owner's Manual

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## **1 Introduction**

The Surefire 503A Stove Sentry is an innovative power station specifically designed to operate wood pellet stoves. When properly installed, it will provide the user many years of service, and will render the user's heating appliance immune to power failures.

To ensure that the Stove Sentry is optimally used and properly connected, the user should take time to read this instruction manual and follow its directions.

### **Here Is How It Works**

The Surefire 503A interfaces between a wood pellet stove and the AC electrical supply.

When electricity is present, the Surefire 503A charges a battery and surveys the power line. At the instant that a power failure occurs, the Surefire 503A converts the energy stored in the battery to AC power. This assures operation of the pellet stove without interruption, during the absence of electricity.

When AC utility power is restored, the Surefire 503A reinstates AC utility power as the prime energy source to operate the pellet stove. Simultaneously and automatically, the Surefire 503A commences the recharging of the battery, to return it to full capacity in preparation for the next power failure.

## **2 Inspection**

Upon removal of the Surefire 503A Stove Sentry from its packaging, the user should examine it for any signs of physical damage sustained in shipment. If damage has occurred, it should be returned to vendor for replacement.

**3** The Surefire 503A Stove Sentry will operate any wood pellet stove that can be configured optionally with an igniter, or wood pellet stoves that come standard with igniters. The Surefire 503A will also operate any stove or kerosene heater that the Surefire 502 is designed for. (See Surefire 502 sales literature for models.)

Examples of Models with igniters as standard features are :

<b>Model</b>	<b>Manufacturer</b>
Profile	Lennox (Whitfield)
1200	Quadrafire

## 4 Battery Considerations

### Battery Selection

Given a fixed output power requirement, the operating time that the *Stove Sentry* will provide in the absence of electricity, is determined only by the size and condition of the battery. **It is important for the user to select a deep cycle, sealed, and maintenance free type, such as a marine battery. Automotive batteries are not recommended.** The battery clamps provided with the Surefire 503A are for top-post batteries. If a side-post battery is used then the user will need to buy two side post clamps.

**The following table relates the battery size to operating time:**

Battery Size A-Hr.	Reserve Capacity Minutes	Wood Pellet Stove	Wood Pellet Stove
		(without igniter) Hours	(with igniter) Hours
50	80	5	4
75	140	7	5.7
100	180	10	8
200	380	20	16

*The above data applies to the Advantage III wood pellet stove.*

The condition of a battery is determined by its ability to attain and maintain a 100% state of charge. In order to measure the state of charge the user should use a digital voltmeter that can display hundredths of a volt when measuring 12 Volts. The user should measure battery voltage at the battery posts, with the battery disconnected. For deep cycle batteries, the following table relates the State of Charge to Battery Voltage.

State of Charge	Battery Voltage
100%	12.7-12.9
80%	12.5-12.6
60%	12.3-12.4
40%	12.1-12.2
20%	11.9-12.0

## 5 Installation

### 5.1 Items Required:

Tools - Medium size straight-slot screw driver.

Battery cables, AWG#8, 6 foot, one red and one black -- both provided.

Battery -- Top-post, deep-cycle marine type.

Surefire 503A Stove Sentry

**5.2 Location** - The Surefire 503A can be mounted vertically or horizontally on a flat smooth surface - wall or floor location

### **THE RECOMMENDED CONFIGURATION**

The Surefire 503A and its associated battery bank should be near to one another. However it is not recommended that liquid batteries should be located in living quarters or near sources of heat e.g. the pellet stove. Ideally the back up system should be installed in a dry garage, crawl space or basement. The 120 VAC utility power can then be transmitted through proper electrical cabling or extension cords to the pellet stove. Other characteristics of the installation location to take into account are:

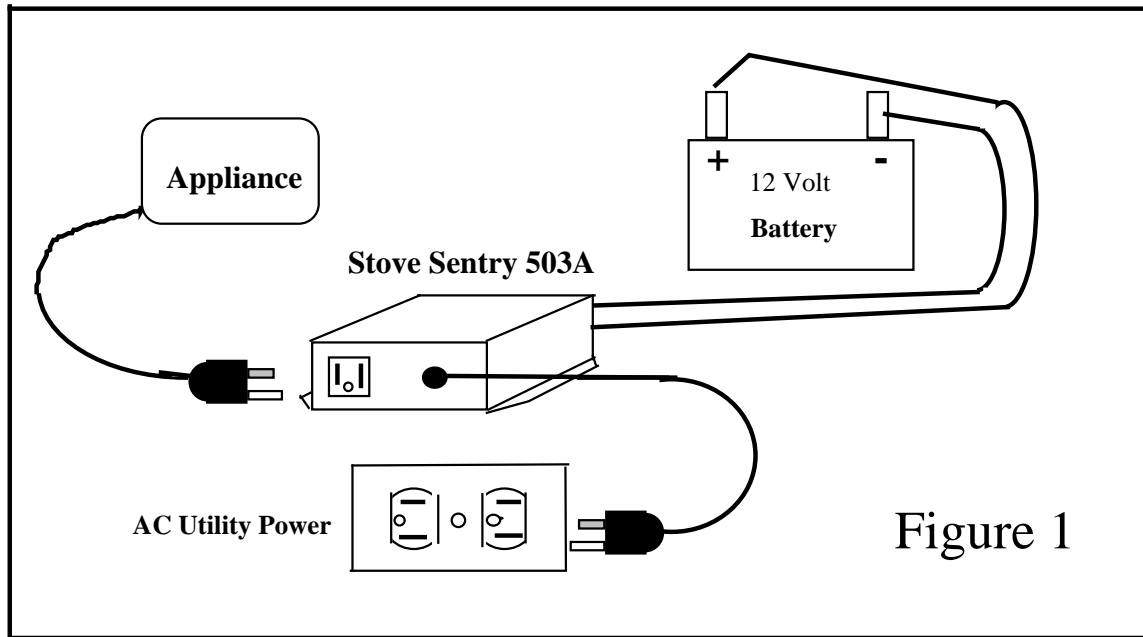
- a) **Close to 3-prong AC outlet** - within 5 feet.
- b) **Dry** - In a location where no liquids, (water or other chemicals) can drip or splash onto the unit.
- c) **Safe**- Do not install the Surefire 503A in the same compartment as batteries or any flammable liquids such as gasoline or kerosene. (Some batteries, while being charged, can emit hydrogen gas requiring the battery to have some ventilation.)
- d) **Ventilated** - Do not block either the fan or the exit air ports of the Surefire 503A. For example, if the unit were to mounted on a carpeted floor or wall, the carpet fibers will block air from the exit ports. Therefore the mounting surface should be flat and smooth. **Do not place objects on top of the unit.** Allow at least 2 inches of air clearance for both sides and top of the unit. Any compartment containing the Surefire 503A system must have some ventilation - it should not be airtight.
- e) **Close to battery** - The Surefire 503A comes with battery cables that are 6 feet in length. Do not use additional wire to increase this distance. It is recommended that the battery be in its own box and at least 2 feet from the Surefire 503A in a space that has some ventilation.
- e) **Cool** - Room air temperature should be between 30 and 105 degrees F. (0 to 40 degrees Centigrade).

**Caution! Do not block or obstruct either the fan or the exit air ports of the unit. Do not place objects on top or against the unit. Overheating and damage to the unit may result.**

**Warning! The Surefire 503A has several components with electrical contacts that switch electrical currents. Opening or closing any of these electrical contacts can produce a spark that could ignite an explosive air mixture. To prevent fire or explosion, do not install the Surefire 503A in a compartment that contains a flammable liquid such as gasoline or in the same box as a battery - which under**

some conditions can emit small quantities of hydrogen gas.

**5.3 Mounting** - The Surefire 503A can be attached to a flat surface using four #10 screws or bolts. The flange on the bottom of unit has cutouts for the screws / bolts. It can also sit on a bare floor (**provided that the floor is not carpeted**).



## 6 Connections (See Figure 1)

### 6.1 Initial hookup procedure

Follow the procedure below to connect the Surefire 503A to the stove and to the battery.

**Step 1** Turn the on/off rocker switch to the **off** position.

**Step 2** Using a straight slot screw driver, loosen set screw in the **black** terminal post of the Surefire 503A. Insert one end of the **BLACK battery cable** into the **BLACK terminal post** of the Surefire 503A. Tighten the set screw. Attach one of the battery clamps provided to the other end of the cable.

**Step 3** Repeat step 2 for the **RED battery cable** inserted into the **RED terminal post** of the Surefire 503A. Tighten set screw.

**Step 4** Connect the battery cables to the battery by placing the battery clamps onto the battery posts. The red cable must be connected to the positive (+) terminal of the battery. The black cable must be connected to the negative (-) terminal of the battery. **Do not reverse! A reverse connection will cause fuses (factory replaceable only) inside the**

**unit to blow and possibly cause other damage. A reversal also voids your warranty.**

**Step 5** Connect the stove / heater to the Surefire 503A by plugging the input ac power cord of the stove / heater into the AC outlet of the Surefire 503A.

**Step 6** Plug the AC input power cord of the Surefire 503A into an ordinary 120 VAC wall outlet. If the wall outlet is controlled by a switch then the switch should be turned on.

**Step 7** Turn the on/off rocker switch of the Surefire 503A to the "on" position unless it is summertime and the stove is not in use.

## **6.2 Installation test**

Energize the stove. After allowing it about 15 minutes to heat up, extract the Stove

Sentry's power cord from the AC wall receptacle to simulate power failure. The stove should continue to operate normally. The fan on the Surefire 503A should be turning and free of air blockage.

In certain pellet stove models, when blowers are operated at very low speed there may be small discernible differences in fan motor speeds between modes when the AC cord is plugged into the wall and when there is back up operation.

Plug the AC power cord back into the wall outlet (or turn switch controlling wall outlet back on if it has been turned off instead of pulling the plug above). The stove should continue to operate. Check to see if the internal fan of the Surefire 503A has stopped. This is normal and indicates that the Surefire 503A has recognized the return of AC. It is now out of the "battery back up" mode and has returned to its normal state of charging the battery.

**Once properly connected, the Stove Sentry system requires no maintenance. When AC power disappears, it will automatically convert battery power to AC power for stove operation. It will automatically replenish the battery when AC power returns. During all of these times and power transitions, the Stove Sentry leaves the supply of power to the heating appliance completely uninterrupted and requires no manual adjustments.**

## **6.3 Changing the battery.**

If for any reason the battery needs changing, it is important to follow the steps below in the order shown to avoid possible damage to the Surefire 503A.

**Step 1** Turn the on/off rocker switch of the Surefire 503A to the off position.

**Step 2** Unplug the input power cord of the Surefire 503A from the wall outlet.

**Step 3** Unplug the input power cord of the stove / heater from the AC outlet of the Surefire 503A.

**Step 4** Disconnect the battery cables from the battery. **Caution: Make sure that step 2 has been done prior to disconnecting the cables.**

**Step 5** Replace battery.

To reconnect the Surefire 503A, follow steps 1 thru 6 of **6.1 the initial wiring hookup procedure.**

## **7 Trouble Shooting Guide**

**7.1** Symptoms and suspected causes are listed below.

<u>Symptom #1</u>	<u>Suspected causes</u>
Stove does not run when AC is present.	a) Stove control turned off. b) Thermostat setting below room temperature. c) Input ac cord to stove not connected to AC outlet of Surefire 503A. d) Input cord of Surefire 503A not connected to AC outlet in wall. e) AC wall outlet dead. f) Stove defective. g) 7A fuse is blown h) Surefire 503A defective.

Note: To ensure that the Surefire 503A is not the problem, perform the following test:

Unplug the input AC cord of the stove from the Surefire 503A and plug it into a 120 VAC wall socket. This bypasses the Surefire 503A. If the Stove still does not work, then the Surefire 503A is not the problem. Look elsewhere for the cause.

<u>Symptom #2</u>	<u>Suspected cause</u>
Stove works OK when AC is present but goes through repeated on and off cycles when AC is removed.	a) Battery is low. Fix: Change battery or give the Surefire 503A time to recharge battery. b) Battery is defective.
<u>Symptom #3</u>	<u>Suspected cause</u>
Stove works OK when AC is present but shuts off when AC is removed	a) Battery is discharged. b) On/off switch of Surefire 503A in off position. c) Battery not connected. d) Surefire 503A has failed.



#### **Symptom #4**

Battery does not recharge

#### **Suspected cause**

- a) Defective Battery
- b) 1A fuse Blown

#### **Symptom #5**

Unit works on back up power only and does not switch to AC even when AC is present at the Surefire 503A power cord.

#### **Suspected cause**

- a) 5A Fuse is blown
- b) 1A Fuse is blown

## **7.2 Functional Trouble Shooting Procedures**

The verification of proper operation of your Surefire 503A Stove Sentry can be performed using **Procedure #1** or **Procedure #2** described below.

**Procedure #1** is recommended if the unit is connected to your wood pellet stove.

Procedure #2 is recommended if the Surefire 503A has been disconnected from your wood pellet stove.

### **7.21 Procedure #1 - Surefire 503A connected to stove.**

a) Make sure that the hookup connections in Section 5 have been made. Then, with the stove in operation (a fire in the box) and the fans of the stove turning, unplug the ac input cord to the Surefire 503A. The stove should continue to function normally.

1. If the stove fans intermittently turns on and off more than a few times, it is a sign that either the battery is near the end of its discharge or that a battery connection is loose. Tighten battery connections if they are loose and plug the ac input cord back into the wall socket and give the Surefire 503A a few hours to recharge the battery.

If battery connections were tight, change the battery.

2. If the fans in the stove are off and remain so, **make sure the on/off rocker switch on the Surefire 503A is in the "on" position.** If there is no change, continue with the steps below.

a) Turn thermostat for up a few degrees to ensure that the stove controls did not shut down the stove at about the same time the AC cord was unplugged.

b) **If the fan on the Surefire 503A is not turning, then perform the following steps:**

1). Check the battery connections.

2) Check the battery voltage with a voltmeter. If battery voltage is less than 11 volts, the battery is dead. If the battery reads 12 Volts or more, the Surefire 503A may be defective.

### **7.22 Procedure #2.**

This procedure is performed on a work bench. Perform the steps below **in order given.**

**Step 1.** a) Place the on/off rocker switch of the Surefire 503A into the off position.  
b) Unplug the Surefire input power cord from the AC wall socket.  
c) Unplug the stove from the Surefire 503A.  
d) Disconnect the battery cables then move the Surefire 503A to a workbench.

**Step 2.** At the workbench, make sure that no connections to the Surefire 503A have been made. If so then remove connections.

**Step 3.** Connect the battery cables to the battery making sure that the ring terminals do not touch each other. (Red cable to the positive(+) battery terminal and the black cable to the (-) terminal).

**Step 4.** Plug an AC line cord of ordinary lamp with a 100 watt bulb or less into a 120 VAC wall socket. Turn on the lamp.

**Step 5.** Leave the lamp switch on. Unplug the lamp and plug the ac line cord of the Surefire 503A into the same wall outlet. Then plug the lamp cord into the AC outlet of the Surefire 503A. The lamp should turn on. If the lamp does not turn on then the Surefire 503A is defective. If the lamp does turn on then leave the lamp switch in the "on" position and proceed to step 6.

**Step 6.** With the lamp on, **turn the on/off switch of the Surefire 503A to the on position.**

Unplug the Surefire 503A from the wall socket but leave the lamp plugged into the Surefire 503A. If the lamp stays on then the Surefire 503A is functioning normally and is in the battery back up mode. If the lamp goes off then either the battery is dead or the Surefire 503A is defective.

**Step 7.** If the lamp went off, ensure that the battery cables are well and properly connected. Ensure that the Surefire 503A "on/off" switch is in the on position. With a voltmeter set to read DC volts measure the battery voltage. If the meter reads 12.5 volts or more then the Surefire 503A is presumed to be defective.

If procedure #2 above indicates that your Surefire 503A has been damaged and your unit is still under warranty then follow the steps outlined in the warranty section. If the warranty period has expired or if the warranty has been violated due to operator error or misuse, then call :

SEC America, LLC, Repair Department, at **802-865-8388** or fax SEC America, LLC at 802-865-8389 to receive authorization for shipment back to factory for a survey and possible repair.

## **8 Warranty**

**The Surefire 503A Stove Sentry comes with a 1 year warranty covering parts and labor. The warranty is described in the warranty card enclosed with this unit. In order to take advantage of the Surefire 503A warranty, please detach and mail the tear off portion of your warranty card within 10 days of purchase.**