



Surefire 512 Stove Sentry  
Instruction Manual

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## **THE RECOMMENDED CONFIGURATION**

**The Surefire 512 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 listed in section 5.2.**

## **1 Introduction**

The Surefire 512 Stove Sentry is an innovative power station specifically designed to operate wood pellet stoves and coal stoker heaters. 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 Surefire 512 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 512 interfaces between a wood pellet stove or coal stoker and the AC electrical supply.

When electricity is present, the Surefire 512 charges a battery and surveys the power line. At the instant that a power failure occurs, the Surefire 512 converts the energy stored in the battery to AC power. This assures operation of the pellet stove or Coal stoker without interruption, during the absence of electricity.

When AC utility power is restored, the Surefire 512 reinstates AC utility power as the prime energy source to operate the pellet stove or coal stoker. Simultaneously and automatically, the Surefire 512 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 512 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 Applications** - The Surefire 512 is designed to operate certain wood pellet or coal stoker stoves under conditions that may arise through their normal use.

## **4 Battery Considerations**

### **Battery Selection**

Given a fixed output power requirement, the operating time that the *Surefire 512* 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 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.

<b>State of Charge</b>	<b>Battery Voltage</b>
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 - philips screw driver  
small slip-joint pliers

Battery - The user should select a battery with wing nut connections if possible. (If the user wishes to use a battery with conventional posts, he should install wing nut adapters.)

**5.2 Location** - The Surefire 512 can be mounted vertically or horizontally on a flat smooth surface - wall or floor location

- 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 512 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 512. 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 512 system must have some ventilation - it should not be airtight.
- e) **Close to battery** - The Surefire 512 comes with battery cables that are four 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 512 in a space that has some ventilation.
- f) **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 512 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 512 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** - Attach the Surefire 512 to a flat surface using four #10 screws or bolts. The flange on the bottom of unit has cutouts for the screws / bolts.

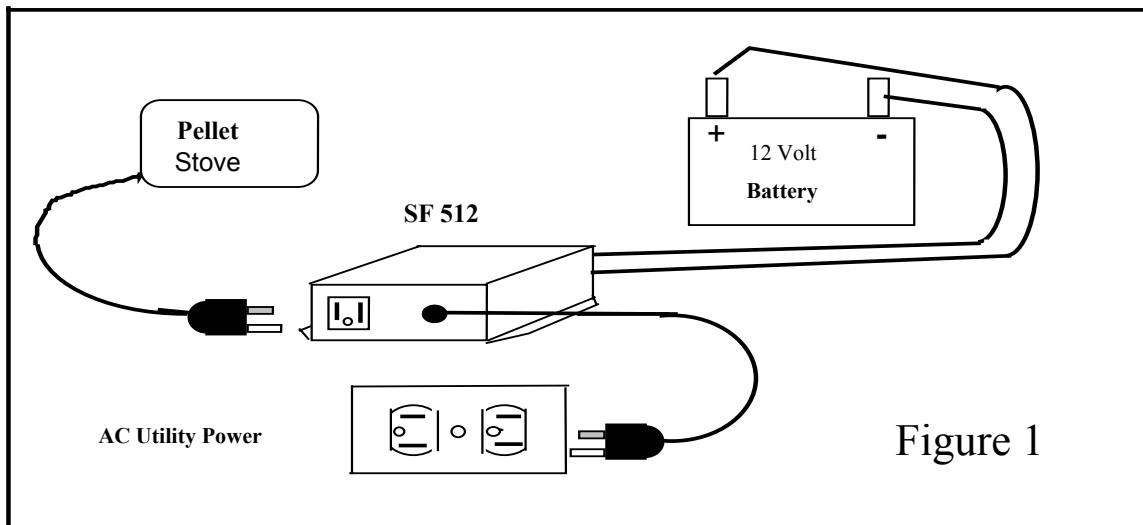


Figure 1

## 6 Connections (See Figure 1)

### 6.1 Initial hookup procedure

After having properly secured the Surefire 512 to its mounting surface, follow the procedure below to connect the unit to the stove / heater and to the battery.

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

**Step 2** Connect the battery cables to the battery. 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 3** Connect the stove / heater to the Surefire 512 by plugging the input ac power cord of the stove / heater into the AC outlet of the Surefire 512.

**Step 4** Plug the AC input power cord of the Surefire 512 into an ordinary 120 VAC wall outlet. If the wall outlet is controlled by a switch then the switch should be turned on.

**Step 5** Turn the on/off rocker switch of the Surefire 512 to the "**on**" position unless it is summer time 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 Surefire 512's power cord from the AC wall receptacle to simulate power failure. The stove should continue to operate normally. The fan on the Surefire 512 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 512 has stopped. This is normal and indicates that the Surefire 512 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 Surefire 512 system requires no maintenance. When AC power disappears, it will automatically convert battery power to AC power for stove or Coal stoker operation. It will automatically replenish the battery when AC power returns. During all of these times and power transitions, the Surefire 512 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 512.

**Step 1** Turn the on/off rocker switch of the Surefire 512 to the off position.

**Step 2** Unplug the input power cord of the Surefire 512 from the wall outlet.

**Step 3** Unplug the input power cord of the stove / heater from the AC outlet of the Surefire 512.

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

**Step 5** Replace battery.

To reconnect the Surefire 512, 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.

#### Symptom #1

Stove/heater does not run when AC is present.

#### Suspected causes

- a) Stove control turned off.
- b) Thermostat setting below room temperature.
- c) Input ac cord to stove not connected to AC outlet of Surefire 512.
- d) Input cord of Surefire 512 not connected to AC outlet in wall.
- e) AC wall outlet dead.
- f) Stove defective.
- g) 5A fuse is blown
- h) Surefire 512 defective.

**Note:**To ensure that the Surefire 512 is not the problem, perform the following test: Unplug the input AC cord of the stove / heater from the Surefire 512 and plug it into a 120 VAC wall socket. This bypasses the Surefire 512. If the Stove / heater still does not work, then the Surefire 512 is not the problem. Look elsewhere for the cause.

#### Symptom #2

Stove / heater works OK when AC is present but goes through repeated on and off cycles when AC is removed.

#### Suspected cause

- a) Battery is low.  
Fix: Change battery or give the Surefire 512 time to recharge battery.
- b) Battery is defective.

#### Symptom #3

Stove / heater works OK when AC is present but shuts off when AC is removed

#### Suspected cause

- a) Battery is discharged.
- b) On/off switch of Surefire 512 in off position.
- c) Battery not connected.
- d) Surefire 512 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 512 power cord.

#### Suspected cause

- a) 6A Fuse is blown
- b) 1A Fuse is blown

## 7.2 Functional Trouble Shooting Procedures

The verification of proper operation of your Surefire 512 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 or Coal stoker.

Procedure #2 is recommended if the Surefire 512 has been disconnected from your wood pellet stove or stoker.

### 7.21 Procedure #1 - Surefire 512 connected to stove / heater

a) Make sure that the hookup connections in Section 5 have been made. Then, with the stove/heater in operation (a fire in the box) and the fans of the stove/heater turning, unplug the ac input cord to the Surefire 512. The stove/heater should continue to function normally.

1. If the stove / heater 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 512 a few hours to recharge the battery.

If battery connections were tight, change the battery.

2. If the fans in the stove / heater are off and remain so, **make sure the on/off rocker switch on the Surefire 512 is in the "on" position**. If there is no change, continue with the steps below.

a) Turn thermostat for stove/heater 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 512 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 512 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 512 into the off position.

b) Unplug the Surefire input power cord from the AC wall socket.

c) Unplug the stove / heater from the Surefire 512.

d) Disconnect the battery cables then move the Surefire 512 to a workbench.

**Step 2.** At the workbench, make sure that no connections to the Surefire 512 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 512 into the same wall outlet. Then plug the lamp cord into the AC outlet of the Surefire 512. The lamp should turn on. If the lamp does not turn on then the Surefire 512 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 512 to the on position.** Unplug the Surefire 512 from the wall socket but leave the lamp plugged into the Surefire 512. If the lamp stays on then the Surefire 512 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 512 is defective.

**Step 7.** If the lamp went off, ensure that the battery cables are well and properly connected. Ensure that the Surefire 512 "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 512 is presumed to be defective.

If procedure #2 above indicates that your Surefire 512 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 at (802) 865-8388 or Fax (802) 865-8389 or write to address:  
PO Box 2266, SO. Burlington, VT 05407 to receive authorization for shipment back to factory for a survey and possible repair.**

## **8 Warranty**

**The Surefire 512 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 512 warranty, please detach and mail the tear off portion of your warranty card within 10 days of purchase.**