

# SWITCH MODE DC POWER SUPPLY



## REGULATED DC POWER SUPPLY

---

MODELS : SEC-1212CE  
SEC-1223CE

# INSTALLATION & OPERATING MANUAL

## TABLE OF CONTENTS

Topic	Page
Important safety instructions	1
Description and features	2
Connection and operation	2
Cooling and fan control	3
Battery charging and back up	3
Trouble shooting	4
Switching power supplies & RF Noise	5,6
Specifications	7



## CAUTION !



RISK OF ELECTRIC SHOCK  
DO NOT OPEN



**WARNING—TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. THERE ARE NO USER SERVICEABLE PARTS INSIDE—REFER TO QUALIFIED SERVICE PERSONNEL.**

### IMPORTANT SAFETY INSTRUCTIONS

Please read before using your power supply.

- 1.) It is recommended that you return your power supply to a qualified Samlex dealer for any service or repair. Incorrect assembly may result in electric shock or fire.
- 2.) To reduce the risk of electric shock, unplug power supply from outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.
- 3.) An extension cord should not be used unless absolutely necessary. **If an extension cord must be used make sure that the pins on the plug are the same number, size and shape as those of the original power supply plug.**
- 4.) Place the unit in an area that will allow air to flow freely around the unit. DO NOT block or obstruct vent openings on the side/bottom of the unit.
- 5.) Keep the unit away from moisture and water.
- 6.) **NEVER OPERATE THE UNITS IN PARALLEL**

### WARNING

Your power supply should be grounded to reduce the risk of electric shock. The power supply is equipped with grounding conductor and grounding plug.

The cord must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances. Never alter the AC cord or plug provided. If the cord will not fit the outlet, have a proper outlet installed by qualified electrician. Improper connection can result in risk of electric shock.

**DO NOT USE THE POWER SUPPLY FOR DIRECT CHARGING OF BATTERY OR DIRECT CONNECTION TO A BATTERY FOR BATTERY BACK-UP. ( Please read the section on Battery Back-up ).**

1.

## **DESCRIPTION**

SEC-1212CE / SEC-1223CE are switched mode power supplies which convert 230 VAC, 50 HZ to regulated 13.8 VDC based on pulse width modulation ( PWM ) control.

## **FEATURES**

BASED ON SWITCHED MODE TECHNOLOGY AND PWM CONTROL

COMPACT AND LIGHTWEIGHT

HIGH EFFICIENCY AND LESS HEAT DISSIPATION

PROTECTED AGAINST SHORT CIRCUIT, OVER CURRENT AND OVER VOLTAGE (THROUGH PWM CONTROLLER)

SEC-1212CE IS CONVECTION COOLED. SEC-1223CE HAS FORCED AIR COOLING AND OVER TEMPERATURE SHUT DOWN

CE MARKED

COMPLIES WITH EUROPEAN EMISSION AND IMMUNITY STANDARDS

## **CONNECTION AND OPERATION**

**NOTE!** The DC output connector has a tubular hole of diameter 0.2" (5mm) with a set screw. For a firm connection, crimp/solder a pin type copper terminal on the cable ends of your 12V DC device.

Ensure that the power supply's ON/OFF switch is off and it is unplugged from the AC outlet.. Switch off your 12 V DC device and connect it's positive and negative to the RED ( Positive ) and WHITE ( Negative ) terminals respectively. Ensure that the connections are secure and tight. Plug the power supply into the AC outlet. Press the ON/Off switch of the power supply to ON and observe that the neon indicator in the switch illuminates. If the indicator fails to light , recheck the connection, AC outlet and the fuse inside the power supply.

Your 12 V DC device may now be switched on.

## **COOLING AND FAN CONTROL / THERMAL SHUT DOWN (SEC-1223CE)**

SEC-1212CE is cooled by convection.

**PLACE THE UNIT IN A WELL VENTILATED OPEN AND COOL AREA.**  
**DO NOT BLOCK THE VENTILATION OPENINGS ON THE SIDES**

SEC-1223CE is cooled by convection and forced air. A temperature controlled fan has been provided to improve cooling at higher loads. The fan is controlled by a sensor mounted on the power transformer. **THE FAN WILL BE OFF AT LOWER LOADS.** It will come on only when the temperature of the power transformer is above 70°C due to higher loads. In case the fan fails or the air flow is blocked, a second temperature sensor mounted on the power transformer will activate over temperature shut down at 100°C. The output voltage will be automatically resumed once the unit cools down.  
**PLACE THE UNIT IN A WELL VENTILATED OPEN AND COOL AREA.**  
**DO NOT BLOCK THE OPENINGS AT THE FAN SUCTION ON THE BOTTOM AND THE DISCHARGE OPENINGS ON THE SIDES.**

## **BATTERY CHARGING AND BATTERY BACK-UP**



**WARNING ! THESE UNITS ARE POWER SUPPLIES AND NOT BATTERY CHARGERS. DO NOT CONNECT THESE UNITS DIRECTLY TO A BATTERY**

These units should **NOT BE DIRECTLY CONNECTED TO A BATTERY** for charging or for battery back-up. Battery charging and battery back-up may be undertaken only when the battery is connected through suitable external isolating diodes and charge limiting resistor. The isolating diode will ensure that the battery does not back power the power supply. When a battery is deeply discharged, it will initially draw a very large charging current and thus, will force the power supply into current limit mode for prolonged periods. This is harmful for the power supply. The charge limiting resistor will limit the charging current, thereby, ensuring that the maximum charging current is well below the current limit value of the power supply.

**WE OFFER OPTIONAL BATTERY BACK-UP AND CHARGING MODULE . PLEASE CONTACT OUR CUSTOMER SERVICE**

## **TROUBLESHOOTING - GENERAL**

**PROBLEM : Power ON/OFF switch does not illuminate when turned on.**

PROBABLE CAUSE

SUGGESTED REMEDY

No power in the AC outlet

Check there is power in the outlet.

AC side fuse inside the power supply is blown

Replace the fuse inside the unit. See fuse ratings at page 8

**PROBLEM : AC side fuse blows as soon as power is turned on.**

PROBABLE CAUSE

SUGGESTED REMEDY

Unit is defective

Call technical support.

**PROBLEM : The output voltage is 0 V or very low**

PROBABLE CAUSE

SUGGESTED REMEDY

Input voltage is very low

Check that the input voltage is 230 VAC

The unit is in current limit condition due to overload caused by large reactive loading or by the output being short circuited

Check the output terminals are not shorted. Remove the load. If the output voltage gets restored, the load is shorted or is offering large reactive impedance.

Unit is shut down due to over temp. (SEC-1223CE)

Check that the fan has not failed or the vent openings are not blocked

**PROBLEM : Output voltage drops as soon as the load is switched on**

PROBABLE CAUSE

SUGGESTED REMEDY

The unit is going into current limit protection mode

Reduce the load current to less than the current limit value. Motors, pumps, compressors, relays, incandescent and halogen lamps and large capacitors in the input section of the DC devices draw very high inrush or starting currents of up to 10 times their normal operating currents. Ensure that these inrush/starting currents are below the current limit value of the power supply.

4.

## **SWITCHING POWER SUPPLIES AND RF NOISE**

1. Switched mode power supplies ( SMPS ) employ high frequency switching and thus, are a source of radio interference, a recipient of radio interference and a conduit of radio interference. ( Older linear type transformer based power supplies do not employ high frequency switching voltages and will be quieter as compared to switching type of supplies ).
2. The primary emission sources originate in the switching devices due to their fast switching current transitions: harmonics of the switching frequency and broadband noise created by under-damped oscillations in the switching circuit. The secondary source is from the bridge rectifier, both rectifier noise and diode recovery. The AC input rectifier / capacitor front end of the switching power supplies ( excepting those with power factor correction ) are notorious for generating power supply harmonics due to the non linear input current waveform. The noise is both conducted and radiated through the input power cord and the DC output wiring to the radio.
3. Switching power supplies are also recipients of radio interference. The normal operation of the power supply can be disturbed due to RF noise getting coupled into the power supply. Thus, the power supply may generate excessive RF noise and lose output voltage regulation due to excessive transmitter energy being coupled through the AC / DC lines to the power supply's regulator feedback path. This may be due to antenna being too close or due to the antenna or feed system not radiating properly. First check the antenna system SWR. Then, if necessary, relocate either the antenna or the power supply farther apart.
4. The receiver may "hear" the power supply. A slowly moving, slightly buzzing carrier heard in the receiver may be caused by the antenna being too close. As with the transmitter related noise pick up, a loose coaxial connector or a broken or a missing ground may aggravate this problem. Normally these noises will be below the background or "band" noise. Increase the separation between the power supply and the receiving antenna. Use an outdoor antenna. This will reduce the amount of signal picked up from the power supply and also increase the amount of the desired signal.
5. The conducted and radiated RF noise from these power supplies is limited by internal filtration. These RF noise currents are filtered and bypassed to the chassis of the power supply. The chassis is, in turn, connected to the earth ground pin of the ac input power cord. Thus, the chassis of the power supply is connected to the earth ground of the 230 VAC distribution system. The net RF noise generated by these power supplies complies with the limits laid down in the European Standards for emissions and immunity.

6. Following additional guidelines may be followed to reduce the effects of RF noise:
- a. Use additional appropriate AC radio frequency interference (RFI) power line filter immediately before the ac input of the power supply. **Recommended:** Corcom Inc. ( [www.cor.com](http://www.cor.com) ) "Q" series. Filtered, ferrite coated cord set ( [www.emceupen.com](http://www.emceupen.com) ) is another choice. These cord sets, with integral line interference filters, reduce common and differential mode interferences over a wide frequency range. Because they are shielded, they are also effective against radiated interferences. In addition to the built-in filter networks, the cable conductors are coated with an RF absorbing ferrite compound. This provides additional attenuation at high frequencies that is lacking in most regular LC filters. The RF absorption of the ferrite-coated cable avoids resonance's at high frequencies, reducing the conducted and radiated RF noises even further
  - b. Use additional appropriate DC radio frequency interference (RFI) power line filter immediately after the dc output of the power supply. **Recommended:** Corcom Inc.([www.cor.com](http://www.cor.com) ) "DA" / "DC" series
  - c. The positive and negative terminals of the dc output side of the power supply are isolated from its chassis. As pointed out at para 5 above, all the noise currents that are internally filtered are bypassed to the chassis of the power supply and onward to the earth ground of the 230 VAC system through the earth ground pin of the power cord. Therefore, the negative terminal of the power supply should never be connected / bonded to the chassis of the power supply.
  - d. Twist the positive and negative wires from the output of the power supply to the radio



### SPECIFICATIONS

INPUT VOLTAGE (NOMINAL):	230 VAC, 50 HZ	
OUTPUT VOLTAGE:	13.8 VDC +/- 1%	
OUTPUT RIPPLE & NOISE: (ON FULL LOAD, PEAK TO PEAK)	SEC-1212CE	120 mV
	SEC-1223CE	150 mV
OUTPUT CURRENT, CONTINUOUS:	SEC-1212CE	10 A
	SEC-1223CE	23 A
CURRENT LIMIT:	SEC-1212CE	14 A
	SEC-1223CE	25 A
COOLING:	SEC-1212CE	CONVECTION
	SEC-1223CE	TEMPERATURE CONTROLLED FAN
PROTECTIONS:	OVER CURRENT, SHORT CIRCUIT AND OVER VOLTAGE (THROUGH PWM CONTROLLER ). OVER TEMPERATURE SHUT DOWN FOR SEC-1223CE	
FUSE RATING:	5 MM X 20 MM GLASS FUSE, 250 V, slow blow	
	SEC-1212CE	2A
	SEC-1223CE	4A
AC INPUT CONNECTION:	DETACHABLE POWER CORD WITH EUROPEAN "SCHUKO" PLUG.	
DC OUTPUT CONNECTION:	TUBULAR HOLE DIA 0.2"(5MM) WITH SET SCREW	
SAFETY STANDARD:	EN60950	
EMI/EMC STANDARD:	EN55022 class B; EN6100-3-2,3; EN61000-4-2,3,4,5,6,8,11	
ENVIRONMENTAL TEMP. RANGE:	0-40° C	
DIMENSIONS ( W X D X H ), INCHES	7.0 X 8.25 X 2.2	
WEIGHT	SEC-1212CE	3 LBS. NET
	SEC-1223CE	3.5 LBS. NET

**NOTE :** SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE



«  
SAMLEX»

, 107140, . , . , . 2/1, .2  
.: +7(495) 980-99-47  
: +7(495) 775-07-06  
[e-mail: sales@samlex.ru](mailto:sales@samlex.ru)

