



SMS1R.48.100

Emergency dc power supply for permanent load, service branch in parallel with battery and DC/AC converter integrated

Sinercom S.r.l.

Headquarter: Via G. Cappalunga 9/A - 00043 Ciampino (RM) - Italy
tel. +39.06.79800323 fax +39.06.79814644

Factory: Via Cascina Secchi 247/4b - 24040 Isso (BG) - Italy
tel. +39.0363.938231 fax +39.0363.998235

USER MANUAL



IT IS MANDATORY THIS TECHNICAL HANDBOOK IS HOUSED IN A PLACE KNOWN TO THE PERSONNEL OPERATING ON THE SMS, SO THAT THEY CAN FIND AND USE IT ANY MOMENT



CONTENTS

SUBJECT	PAG.
Safety requirements and First AIDS	3
Safety instruction / Sell off	3
Introduction and operation	4
Standing	4
Electrical protections	5
Initial turn-on and checks	5
LCD Display and LED Signaling	6
Test batteries description	7
Inverter functions	7
Power Supply total switch off	7
Remote Communications	8
Power Supply sizing and weight	8
Troubleshooting	9
Maintenance	9

SAFETY RULES

This manual will be really important to use the SMS1R-48-100R in a properly way. Follow without exceptions all the indications for the first setting of the SMS.

Before start any maintenance operation of the SMS, be shure that electrical input is switched off. Do not try to repair the SMS by your own. Taking off the protections there is the possibility to be exposed at dangerous voltage. In the eventuality of a SMS breakdown call our service point or directly the factory.

CAUTION: SMS has batteries inside for the normal functions. This meaning that in absence of input voltage you will have dc output voltage until the end of battery discharge .

Maximum load on the floor

According to the weight of the SMS, the installation site must have a floor capable to carry the equipment weight. When in doubt, consult the building firm.

Ventilation

The right work temperature of SMS should be in between 0 °C and 40 °C. The room temperature shouldn't be over 25 °C. The warm air product by SMS is extract form the SMS by fans and has to be extract from the room by normal fans coiler or an air conditioned system.

Overheating

Keep the air way, in and out, free of any obstruction. Nothing as to be on the roof of the SMS. The SMS as to be always far from any heat unit or any apparatus producing flames or liquids.

Electrical caution

Inside the SMS are present dangerous voltages. Do not open the SMS cabinets: all the boards and components inside the SMS cannot be repaired by the user. Do not remove any protective covert inside the SMS.

Batteries

During electrolysis, the battery produces Hydrogen gas. If the quantity of Hydrogen in the room will be excessive there is a risk to have an explosion. The room as to be well aerated in conformity of Standard EN50091 - 1, to avoid the explosion risk. If the temperature is over 25 °C the battery will last less. The right room temperature should be in between 15 °C e 25°C.

CAUTION: Every 6 months maximum, if the SMS is not connected, the battery has to be charged.

Check the battery blocks in any eventually accident! A single block broken could let get out the electrolyte which would burn the skin and eat metals, paint and cloth.

Protective gloves

If you have to manage damaged batteries use protective gloves.

Strip metal objects.

Using SMS strip all personal objects: rings, watches, steel pens, etc. which can cause a short circuit. Batteries are always actives and their short circuit can make many damages.

Do not smoke

Using SMS do not smoke and don't use free flames; avoid to create electric arcs when working on SMS and do not wear cloths that can cause static charges.

Service

Service has to be made by our specialized technicians.

Staff information

All the staff who will work with SMS, specialized or not, has to know very well these safety rules.

FIRST AIDS

Emergency power off

In an emergency case, the load supply can be disconnected opening all the lever switches fitted in the front lower side of SMS, opening the door.

First aids for electric shock

Turn off or open the power supply line, or use an isolatededry material to protect itself while moving the victim far away from any electrical cable.

Do not touch the victim with hands until the latter is far away from any electric wire. Seek immediately for medical help.

People contaminated by corroding liquids

Should the batteries electrolyte come into contact with skin, rinse abundantly with water the skin; remove the contaminated clothes; apply dry gauze to the contaminated skin.

Should the batteries electrolyte come into contact with eyes, wash them immediately with a saline water solution or with fresh water for 10 minutes at least.

People having ingested corroding liquids

Should the batteries electrolyte ingested, do not induce vomiting but let the victim drink as much water or milk as he likes.

AT ALL EVENTS SEEK IMMEDIATELY FOR MEDICAL HELP

SAFETY INSTRUCTION

Installation

The SMS must be installed by qualified personnel, following instruction given in chapter – Initial turn-on and checks.

In case of fire

Inside the SMS dangerous voltage is present, even if all the switches are off ! For this reason in case of a fire: **do not use water** to put out a fire.

Personnel training

All personnel operating on SMS have to be trained to perform the Emergency Power Off (see First Aids).

DISMANTLING AND DISPOSAL

Should the SMS be dismantled, the parts making it up must be assigned to companies specialized in the disposal and recycling or industrial waste, specifically:

Disposal of packing

Packing consist of biodegradable material. The cardboard can be sent to companies assigned to recuperating cellulose. Polyurethane foam protective profiles are chemically inert, they do not contribute to gas forming nor to pollute water; theyr disposal can be assigned to companies specialized in the disposal of industrial materials.

Disposal of metal parts

The metal parts of the cabinet, both the varnished ones and the stainless steel ones, are regularly recovered by companies specialized in the scrapping of metals.

Disposal of electronic cards

It is mandatory that the electronic cards be disposed of companies specialized in the disposal of electronic compon.

Disposal of batteries

Batteries must be separated form any other part of SMS and disposed according to the norms locally current about disposal of toxic and noxious materials.

Disposal of other parts

The disposal of other parts making up the SMS, i.e., rubber gaskets, plastic materials and wiring in assigned to companies specialized in the disposal of industrial materials.

INTRODUCTION AND OPERATION

We would like to say thank you to choose SMS1R-48-100R series, emergency dc power supply.

In normal conditions the load is powered from main converter AC/DC between the batteries are continuously recharged with a charging curve IUo. When the mains has either failed and /or the SMS is faulty, the load will be powered from battery without loss of power to the load. When mains will come regularly or the cause that had produced fails clears, SMS will revert in normal function, this meaning the load will be powered from main converter AC/DC between the batteries are continuously recharged with a charging curve IUo. To improve batteries performances the battery charger follow SMS temperature by sensors and change charging voltage if necessary; every 15 days a battery test will start automatically. In this way we can evitate to damage SMS by batteries conditions and also the sulphurations of the batteries grids.

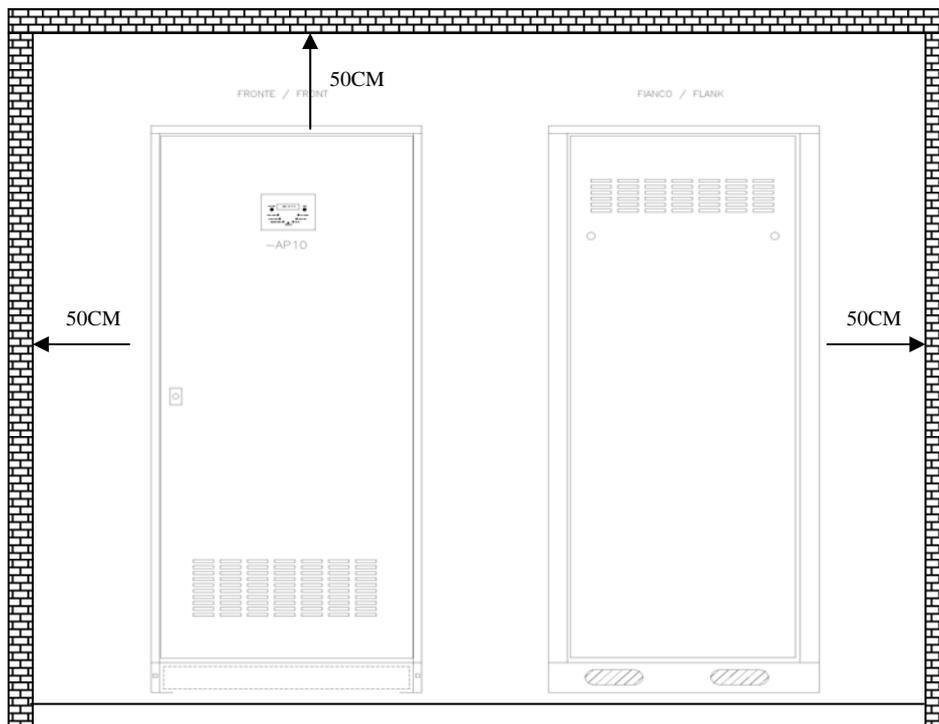
Every SMS is composed by:

- Isolating transformers / fitting voltage with screen between first and last;
- Tyristors rectifier bridge;
- L/C filter rectifier bridge to reduce ac system component (ripple);
- Air forced system;
- Rectifier bridge logic control circuit;
- Alarm circuit rectifier and batteries function;
- Display LCD.

SITING IT IN THE OPERATIVE POSITION

SMS has to be installed in a clean and dry room, if possible without dust. The room need interchange of air sufficient enough to dispel heat produced by SMS, in case that is non possible you have to install an air conditioned system. When battery is present, room need interchange of air sufficient enough to dispel hydrogen gas according the norms. Moreover SMS has to be sit in the operative position with at least 50 cm between SMS and any object. To move SMS slide the forks of the lift truck under the SMS.

Minimal distance between SMS and objects or walls



ELECTRICAL PROTECTION FOR INPUT MAIN POINT OF SMS

We suggest the customer to instal a safety magnetothermic switch to protect the input line of SMS . See the following table:

SERIES SMS1R- 48-100R	INPUT SWIT. Curve D	SECTION AC INPUT CABLE	SECTION DC OUTPUT CABLE	SECTION AC OUTPUT CABLE
COD.	Amp	mmq	mmq	mmq
SMS1R-48-100R	4 x 16 Amp Idn= 0,3Amp classe A	6	16	1,5/4

INITIAL TURN-ON AND CECKS (MAINS LINE PRESENT)

For the initial turn-on see the following table:

IMPORTANT							
<u>BEFORE ACTIVATING THE SMS WE SUGGEST TO READ AND FOLLOW ALL THE STEPS</u>							
1	OPEN THE MAIN DOOR OF THE SMS, REMUVE PROTECTION TO REACH THE BATTERIES SPACE, BE SHURE TO OPERATE IN SAFETY, ALL THE SWITCH HAVE TO BE IN "OFF" POSITION						
2	CONNECT THE GROUND LEAD TO THE SMS CABINET						
3	CONNECT THE "INPUT – OUTPUT – ALARM – BATTERIES" CABLES TO THE CONCERNING TERMINAL BOARDS AND/OR BUSBAR. FOLLOW TECHNICAL DRAWING FOR AN EASY CONNECTION AND HOW FIND THE TERMINALS BOARDS. FOLLOW TECHNICAL DRAWING FOR AN EASY INSTALLATION OF THE BATTERIES INSIDE THE SMS. THE BATTERIES POLARITY HAS TO BE RESPECTED WITH SMS CONNECTION. POLARITY INVERSION CAN DAMAGE THE SMS AND CAN BE DANGEROUS FOR PEOPLE						
4	CAUTION : DO NOT CONNECT OUTPUT FROM TERMINALS "X4" IN PARALLEL AND/OR ON THE LOADS						
INITIAL TURN-ON OPERATIONS							
FASE N°	OPERATIONS	SIGNALING LEDs	LED color	LED Status	Buzzer Status	DISPLAY	No tes
4	When the connections to the terminals are all made you can give input voltage from the electrical board to the SMS.						
5	Check if is correct the input voltage. Ceck the cyclic sense of the phases (ONLY FOR SYSTEMS 3F e 3F+N); if the cycling sense is not correct the SMS will not start.						
6	Switch on the mains input – QF1						
7	Ceck the presence of the following indications:						
		LINE OK	GREEN	ON	TRANSITO RY ON	SMS1R 48V 100 AVVIO IN CORSO	
	After 7 sec. between the SMS make some starting test, SMS has to reach the following situation:	RECTIFIER OK	GREEN	ON		SMS1R 48V 100 FUNZ.REGOLARE	
	After 6 sec. from the start of the rectifier, SMS has to reach the following situation:	EQUALIZING CHARGE	GREEN	ON		SMS1R 48V 100 FUNZ.REGOLARE	
8	Ceck the polarity from batteries and rectifier, if correct introduce fuses inside QF3 (batteries) and close it.						
9	Close the output c.c. general switch – QS1						
10	Close the switches –QM1 –QM2 –QM3 –QM4 to powered c.c. loads						
12	Close the input switch inverter – QS2						
13	Close the switches –QM5 –QM6 –QM7 –QM8 To powered c.a.loads						
14	Close the main door of the SMS						
15	End of operations						

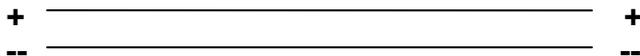
IMPORTANT:



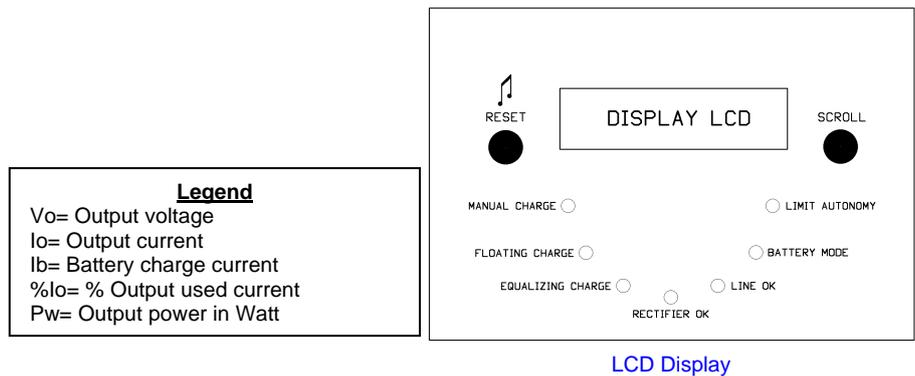
ANY OPERATION OF SERVICE, INSTALLATION, MAINTENANCE HAS TO BE MADE BY SPECIALIZED TECHNICIANS WELL TRAINED.

SMS PARALLEL CONNECTION:

TO CONNECT SMS's IN PARALLEL YOU HAVE TO CONNECT 48VDC +/- SWITCHES WITH A RIGHT DIMENSIONATED CABLE. CONNECT THE SWITCHES AS THE FOLLOWING SCHEME. LOAD COULD NOT BE EXACTLY DIVIDED FOR THE TOLERANCE OF THE SMS COMPONENTS.



LCD PANEL and LED FUNCTIONS DESCRIPTION



LCD Display

	Situation	Message		Situation	Message
Rif.1	First screen	SMS1R 48V 100 ON STARTED	Rif.7	Rectifier fault and/or mains failed	SMS1R 48V 100 RECTIFIER OFF
Rif.2	Following screen When start is done	SMS1R 48V 100 NORMAL OPERATION	Rif.8	OVERLOAD	SMS1R 48V 100 OVERLOAD
Rif.3	Pushing scroll key	Vo Io Ib	Rif.9	TEST BATTERY IN PROGRESS	SMS1R 48V 100 TEST BATTERY ON
Rif.4	Pushing scroll key	%Iout Pw out	Rif.10	TEST BATTERIE FAILED	SMS1R 48V 100 BATTERY FAULT
Rif.5	Pushing scroll key	MANUAL TEST BATT PUSH RESET 5SEC			
Rif.6	Pushing scroll key	SMS1R 48V 100 NORMAL OPERATION			

If you stand at point Rif.3 or Rif.4 or Rif.5 after 60sec. the system will go to Rif.2

Legend led function on frontal panel

- Pushbuttons RESET:** To use for: silent the buzzer, start the battery test when is in the right page, reset all the memorized allarms. To silent the buzzer keep the button pushed for 2sec.
- Pushbuttons SCROLL:** To change the Menu's pages.
- Led LIMIT AUTONOMY :** Red colour. It's start when the battery go in discharge if the battery reach a limit operative discharge value.
- Led BATTERY MODE :** Yellow colour flashing with buzzer on. It is active during the battery powered the load for a black-out and/or a rectifier bridge failure.
- Led LINE OK :** Green colour. Input mains correct.
- Led RECTIFIER OK :** Green colour. AC/DC function correct.
- Led EQUALIZING CHARGE :** Green colour. Preservation charging voltage correct.

BATTERIES TEST FUNCTION

BATTERIES TEST function in SMS rectifier has made by starting a lowest voltage from the rectifier until a pre-established value; in this way the battery will give energy to the load between the micro ceck the battery voltage.

In case of a battery or battery fuse failure, the battery test is immediately stopped and the rectifier came back to a normal function. The test last 60 sec. If the battery test fail, the display will show “AVARIA BATTERIE” and the buzzer will be on.

The Battery test do not start in the following events:

- Mains fault
- Overload

The test is working in two different way :

TEST MAN (requested function) the Battery test start just if you reach the input from the right pages on the display;

TEST AUT (normal function) the battery test start automaticly every 15 days.

HOW ACTIVATE THE BATTERY TEST

TEST MAN

- With the pushbutton SCROLL reach the page where is wrote “**MANUAL TEST BATT PUSH RESET 5SEC**”
- Pushbutton RESET until on the display you will see “TEST ON” and the buzzer will ring (silenced)

INVERTER FUNCTION

The converter DC/AC (See the electric schematic _GS1 attached) present on the rectifier, has an active power of 1000W and has n. 4 a.c. output (230VAC 50Hz sinusoidal) with switch protecting –QM5 –QM6 –QM7 –QM8 on the terminal from X4/1 to X4/8 . To switch on the converter DC/AC switch in ON position the switch –QS2.

IT'S IMPORTANT TO REMEMBER THAT THIS MODEL OF CONVERTER DC/AC DO NOT WORKING IN PARALEL WITH OTHER CONVERTERS IT IS ALSO IMPORTANT TO CECK ALWAYS THAT THE AC LOAD WILL BE CONNECTED JUST AT ONE SINGLE CONVERTER . IF YOU CONNECT TWO CONVERTERS DC/AC IN PARALEL YOU WILL DAMAGE THEM.

SMS's TOTAL SWITCH OFF

To switch off totally the SMS system see the following indications:

1. Open the main door;
2. Be shure all the loads are off;
3. Turn OFF the battery switch –QF3
4. Turn OFF the output switch –QS1
5. Turn OFF the input inverter switch –QS2
6. Turn OFF the main input switch –QF1
7. Eventually open the output switch –QF3
8. The rectifier is off.

IMPORTANT:



THIS SWITCH OFF PROTOCOL IS REFERE TO A SINGLE UNIT, SO CECK THE SECOND PARALEL UNIT AND MAKE THE SAME OPERATIONS IF NECESSARY.

IMPORTANT:



ANY OPERATION OF SERVICE, INSTALLATION, MAINTENANCE HAS TO BE MADE BY SPECIALIZED TECHNICIANS WELL TRAINED.

REMOTE ALARM

SMS's complete of an interface relay card with cold contacts free for the user with a door 0,1Amp at 230VAC. Every alarm has the 3 contacts available (Com-NO-NC). The connections to the contacts are available directly on the board.

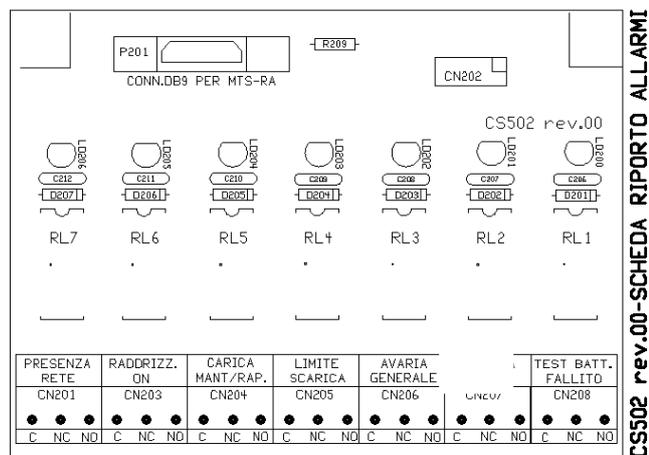


Fig.2.Interface board

INTERFACE OF COMMUNICATION - (cod.502 plus)

- There are 7 alarms to signal this situations:

- Alarm 1: mains line off
- Alarm 2: rectifier faulty
- Alarm 3: Deep/Equalizing charge (change's contact)
- Alarm 4: Battery flat
- Alarm 5: General faulty
- Alarm 6: (NOT AVAILABLE)
- Alarm 7: Battery test failed

DIMENSIONS AND WEIGHT

Dimensions(l*p*h) : 800*800*1900mm

Empty SMS weight : ≅ 305Kg

Complete SMS weight (with battery) : ≅ 690Kg

TROUBLESHOOTING

Kind of problem	Cause	Action
Any LED or LCD on;	Not properly electric connection ; Protection's activated;	Ceck mains line; Ceck input connections; Ceck the switch position–QF1; Ceck fuses in –QF2; Call the Sevice.
Rectifier does not start;	Protections intervention; Rectifier control board failure;	Ceck the input cyclic sense (just for 3F versions); Ceck visual indications on the ceck rectifier board –AP7 Led DL2; Call the Sevice;
During the normal operations load is not powered;	Protections intervention;	Ceck the output switch;
During the black out time load is not powered;	Protections intervention; Battery failure;	Ceck fuses switch–QF3; Ceck battery status; Call the Sevice;
AC output is not available	Protections intervention;	Ceck the output switch –QS2; Ceck fuse on the inverter board; Ceck the output switch –QM5 e –QM6;

MAINTENANCE

SMS1R-48-100R series has been projected to needs a little maintenance..

Ad ogni modo si raccomanda di tenere sgombre le griglie da polvere ed oggetti vari al fine di assicurare il massimo grado di scambio termico.

Carefull on the following tips:

EVERY THREE MONTHS

- Ceck Current and voltage from the rectifier to the batteriy;

EVERY SIX MONTHS

- Give to the battery a deep discharge and ceck how the recharge is working;

EVERY YEAR

- Call the Service to have a general ceck made by a deep cleanness, all the necessary test and regulations to keep the SMS at the best conditions.

IMPORTANT: ALL THE TECHNICAL OPERATIONS HAVE TO BE MADE BY A SPECIALIZED TECHNICIAN.