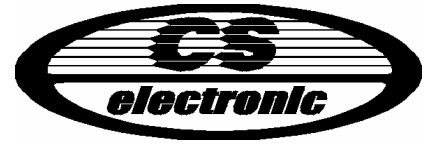




Instruction Manual
www.cs-electronic.com



Space Charger

Instructions





Thank you for purchasing this high quality CS-Product. You can be sure to have chosen a product developed to the highest standards of today's technology. With this product, CS electronic sets the pace for tomorrows racing today!

1. Connection

Connect the alligator clips from the grey double wire to the poles of car battery or a stabilised mains unit with a power outlet of at least 6 amps. Voltage should be in a range from 12 to 13,8 volts.

Connect the black and red wires with alligator clips to the pack to be charged. Again: red = plus, black = minus.

2. Set Up

After switching on the voltage, Space Charger shows sequentially copyright, version and the preset values. Next the main menu appears:

Arrow Up Key (SET):

Push the arrow up key and you can read and set the charge current by pressing up or down keys between 0.5 and 5.5 amperes.

If you don't push any key for 5 seconds, you are back in main menu. Pressing ENTER brings you to the peak adjustment.

While the peak value is displayed you can set it with the arrow keys. The optimum set points for Nickel Metal Hydride or Nickel Cadmium packs are shown by text (NiMh - NiCad) . You can select values between 20 and 200 mV. No key press for 5 seconds again brings you back to main menu or you push the ENTER key and can set the delay time for automatic start.

Setting 1 to 99 minutes of start delay are possible, 0 means immediate start after pushing the start button. Pushing the ENTER key or no key for 5 seconds and you are in main menu.

Hint: If some messages are in German language, you can switch to English: disconnect Space Charger, push and hold ENTER key, connect Space Charger again.

3. Charging

Press the ENTER key (GO) in main menu and charging starts.

If you have set the timer between 1 and 99 minutes, the display shows count down and you can do other things. Charging will begin automatically if time is elapsed.

Independent of the preset start timer you can start charging any time by pressing the ENTER button again.

If you push ENTER while charging is in progress, charging is paused. The display shows then for example:

Pause 267 mAh

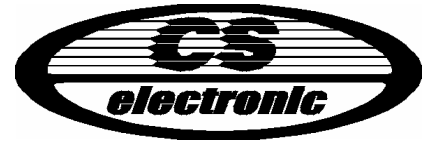
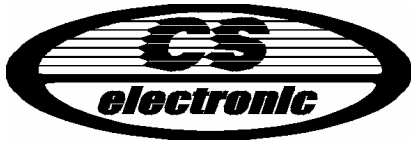
Another press at the ENTER key and charging continues.

While Space Charger is charging, the display shows the following sequentially:

12:27 4,0A 8,37V Charge Time, Charge Current, Pack Voltage

15:26 1035 mAh Charge Time, Charged Capacity

22:54 Pk 0/120 Charge Time, Actual Peak Voltage in mV / preset Peak Voltage in mV



4. End Of Charging

If the peak is reached, the Space Charger stops and shows as follows:

End: 2122 mAh	Total charged Capacity
End: 9,32 V	Cut Off Voltage
End: 86354J	Total Charged Energy (Voltage x Current x Time)
End: 30:32	Total Charge Time, inclusive possibly made interrupts
End: <ENTER>	Press ENTER for main menu

Hint: If you disconnect the pack while paused, charging is finished immediately.

5. Space Game

Press arrow down for the little reaction game:

SPACE GAME READY

HIGH SCORE 112

After these displays you can move the gap in the black block at the left up and down with arrow keys, to open the space for the arrow coming from the right. After five arrows, the wall is moving one step to the right and your reaction time is becoming shorter and shorter. If you hit the wall, your score is shown and if higher than the high score, your score replaces it.

Simultaneous pressing of up and down keys deletes high score.

You can play Space Game also while charging or while count down is in progress by pressing arrow down key. If no key is pressed for three games or you press ENTER, display goes back to main menu, count down or charge values.

6. Error Handling

Space Charger has many error detections built in. Some wrong usages i.e. cross connection of source lead only in no function, others like 12V source low are shown at the display.

Space Charger is designed for charging of 6-cell packs. You can also charge packs of less than 6 cells, but the charge current is then reduced automatically to a lower value.

The charger is protected by a 10 Amps fuse.

In the first minute of charging peak detection is disabled, because total discharged NiMH packs would cut off.

7. Important Notes

Even if Space Charger is correcting many error conditions, you should carefully follow the following notes:

Never let Space Charger charge without supervising.

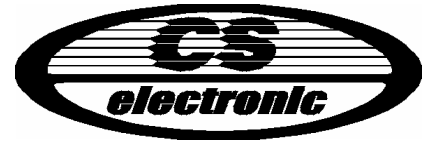
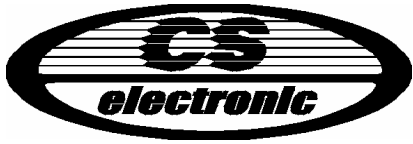
Never close the air on the bottom of the charger. Don't put the Space Charger on dirty or wet ground, because the fan would blow it inside the charger.

If it is necessary to change the fuse use only same type and spec.

Usage is very easy, but never let children use it without supervising of an adult.

If something unexpected happens, disconnect all wires immediately.

Space charger cannot detect, which type of cells is used, so always check the peak cut off you have preset. The wrong peak value can damage your pack.



8. Hints

Space Charger is a peak detecting charger with constant current. Peak detection means, that the negative voltage curve is used, to find out the full condition of the charged pack.

Nickel Cadmium cells and also Nickel Metal Hydride cells change the voltage while they are charged. This voltage is rising slowly over time and if the pack is fully charged, the voltage drops. NiCad packs have a big voltage drop, NiMh packs let the voltage only drop a few millivolts. Increasing age of the packs makes the detection easier.

On Space Charger you can adjust this peak voltage. Recommended values for NiMh packs with 6 cells is 30 mV and NiCd packs can use 120 mV. If the packs are older, you can increase carefully this settings.

9. What's if...

...no display is shown and nothing is working ?

- 12 V cross connected or main unit has no output – connect the right way, check main unit
- fuse melted – replace **ATTENTION:** check charge current after replacing fuse!

...“No Current“ is displayed ?

- pack not connected properly – check connectors
- pack broken / defect – check with another pack

...“Short Cut“ is displayed ?

- pack connectors shortened – separate clips
- pack was deep discharged – if charging is not starting within 20 seconds, check pack
- pack cross connected – check connection

...“12 V low : 9,8V“ is shown ?

- source voltage is too low – check mains unit or car battery

10. Warranty / Update

If a problem occurs, send Space Charger to the following address and if warranty is requested, put a copy of the purchasing invoice into the box. An exact description of the problem is absolutely necessary for proper repair and / or check. If in future a possible software update is available, send your unit to the same address.



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