

ECO
CHARGER™

Introduction

Congratulations on the purchase of this product! It helps you, the environment and your wallet. The minimal effort it takes to recharge the batteries is definitely worthwhile.

You can recharge discharged Ni-Cd/Ni-MHs with the Eco Charger—its sophisticated engineering will yield great results.

Before the Eco Charger, regular alkaline batteries could not be recharged for safety reasons. Now you can recharge alkaline batteries again and again. If you do so regularly you will get a lot more use out of your batteries, your personal battery consumption will decrease and you will save real money.

You should freshen up new batteries with the Eco Charger after relatively short use. This will maintain the capacity of new batteries for longer.

What the Eco Charger can't do:

It can't revive old batteries or near-dead batteries. These are definitely finished.

We suggest:

Start with new batteries and freshen them up regularly. You can freshen up your batteries 30 times, 50 times and even more until the day when even the sophisticated Eco Charger has to declare them exhausted. By then the batteries will have exceeded their life expectancy several times over and you can be proud of yourself: you have made a contribution to the environment and at the same time saved money.

Your Saitek Team

2.3 A Final Tip

Start with fresh batteries, label them in order to differentiate them from other batteries and freshen them up continuously. You can continue this up to 50 times until the Eco Charger's sophisticated electronics declares them dead. The result?—the Eco Charger has significantly extended the lifespan of your batteries.

2.4 Special Advice for Recharging Ni-Cd (rechargeable) Batteries.

The Eco Charger...

- ... recharges them to their greatest capacity,
- ... terminates recharging at the appropriate time and thereby avoids overcharging,
- ... recharges according to the recharging capacity of the rechargeables,
- ... avoids weakening Ni-Cd by recharging them for the correct period of time (unlike other rechargers, which often overcharge).
- ... suppresses Memory Effect* through a combination of recharging and discharging.
- ... can often "repair" Ni-Cd incorrectly recharged by other devices.

**Memory Effect* is a phenomenon peculiar to Ni-Cd batteries—it refers to the reduction in capacity and life of Ni-Cds if they are recharged frequently without being fully discharged first. The Eco Charger counteracts this effect by discharging each battery first, before recharging it to its full strength.

Now you know the Eco Charger's many advantages. Use it correctly and it will help you to save.

Technical Specifications

AC Adapter

Input: dependant on local AC supply

Output: DC 6 volts / 500 mA

Plug: outer diameter 5.5mm inner diameter 2.1mm, center positive

Only for use in rooms without excessive humidity

German TÜV tested and certified

Recharger Unit

Input: 6 volts DC

Output: maximum 145 mA per recharging slot

Maximum Rated
Charging Capacity
(For Ni-Cd/Ni-MH)

180 mAh
800 mAh
2,500 mAh
5,000 mAh

Ni-Cd/Ni-MH Battery
Size

Micro /LR 03 /AAA
Mignon /LR 6 /AA
Baby /LR 14 /C
Mono /LR 20 /D

Usage of electricity less than about 0.02 cents per hour to recharge a D cell; (Note that this may vary, depending on the cost of electricity in your locality).

Safety Information

- * Please handle the Eco Charger as carefully as any other electrical device.
- * Avoid using in humid rooms.

Warning: Only use the original AC adapter. Other adapters can cause damage which can void your Eco Charger warranty.

- * Before recharging: check whether the batteries are Ni-Cd/Ni-MHs or regular and adjust the switch accordingly.
- * Only recharge the batteries specified:
Size: AAA, AA, C, D
Type: 1.2 Volt Ni-Cd/Ni-MH or 1.5 Volt alkaline batteries. Never recharge lithium or unknown batteries. Only recharge undamaged batteries, never dead or rusty batteries.
- * Take batteries out of their slots once they have been recharged. Don't store recharged batteries in the recharging slots.
- * Disposal of batteries: please consider the environment. Thank you!
- * Check the AC adapter regularly. If damaged, don't use it.
- * Your warranty becomes invalid if you use the wrong batteries, a different AC adapter, or the wrong voltage.

Saitek reserves the right to make technical changes without notice in the interest of progress.

Troubleshooting Guide

| Symptoms | Possible Causes | Action To Take |
|--|---|---|
| The unit doesn't work. | 1. Wrong AC adapter. | Use only the AC adapter supplied. |
| | 2. AC adapter is defective. | Obtain a new Saitek AC adapter. |
| The warning tone keeps sounding. | 1. The REGULAR/Ni-Cd switch was pushed accidentally after starting recharging. | Set the switch back to its original position. |
| | 2. You changed the REGULAR/Ni-Cd switch setting. | Remove the batteries, set the switch correctly, insert the batteries again. |
| | 3. The Eco Charger has identified a faulty battery. | Remove the faulty battery. |
| A battery is inserted but the battery symbol does not flash. | 1. Loose or bad contact. | Reinsert the battery; rotate or move the battery until a good contact is established. |
| Battery symbol still does not flash. | 2. Faulty battery. | Remove and dispose of faulty batteries. |
| Battery symbol is displayed although there is no battery in the slot. | The Eco Charger is still running its discharge process or the recharging test. | Wait until unit completes test (up to 3 minutes); or, briefly disconnect AC adapter. |
| Poor performance from a recharged alkaline battery. | 1. Was left lying in the slot after being freshened up. | Freshen up again before use. |
| | 2. Batteries have varying responses to the recharging process. | Replace the battery. |
| Very modest performance from an alkaline battery. | Remaining capacity is too low to be restored; battery has reached the end of its rechargeable life. | Dispose of the battery as directed by local authorities. |
| While recharging a Ni-Cd/Ni-MH battery, size selection and battery analysis is repeated every three minutes. | Faulty Ni-Cd/Ni-MH battery. | Dispose of the battery as directed by local authorities. |
| Abnormal LCD display: e.g. empty slots shown as occupied; or, warning symbol appears. | The battery has been inserted backwards. | Reinsert the battery, making sure to observe the correct polarity. |

Common Questions and Answers

Question 1: On alkaline batteries there is a warning not to recharge them. Isn't it dangerous to recharge these batteries?

Answer:

This warning is aimed specifically at conventional battery rechargers, which cannot be used to recharge alkaline batteries. This warning leads to the waste of countless batteries around the world. The Eco Charger's new technology, however, is completely harmless and safe. This has been confirmed by independent laboratories.

Question 2: How do I get the best performance out of the Eco Charger?

Answer:

- a) Freshen up alkaline batteries as frequently as possible. Start when the batteries are nearly new, not just when you notice a drop in performance. By this time it's already too late to freshen up the batteries properly. Remember that regular batteries and Ni-Cd/Ni-MHs have different reactions.
- b) Freshen up as soon as possible after use.
- c) Freshen up again if possible, directly before renewed use after having been stored for some time.
- d) Use batteries soon after freshening up. With longer breaks in use, freshen up again before the next use.

Question 3: How long does it take to recharge or freshen up a battery?

Answer:

The time depends on the type, brand, size, condition and usage of the battery. The time can vary anywhere from several minutes to many hours. In order to freshen up alkaline batteries extra carefully the Eco Charger takes as much time as is necessary.

Question 4: Can I use batteries before they are fully recharged?

Answer:

Yes, you can remove the batteries at any time. However, the energy level will be lower because they have not been charged to the full. Recharge soon after use.

Question 5: How expensive is recharging?

Answer:

If 4 D cell batteries (which use the most electricity) are recharged simultaneously the cost is less than 0.02 cents per hour and battery. The smaller batteries are even cheaper to recharge. Note: this may vary, depending on the cost of electricity in your locality.

Question 6: How often can alkaline batteries be recharged?

Answer:

That depends on battery size, brand, discharge and many other factors. The

number of recharges can range from 8 to 50 times. The more frequently you recharge the better.

Question 7: Frequently the Eco Charger requires less time for recharging than first shown. Is this correct?

Answer:

The original number of hours displayed is merely an estimate, and the initial display shows the maximum possible time. The actual time taken depends on many factors, some of which can change while the battery is being monitored. Just let yourself be pleasantly surprised: the Eco Charger will try to finish recharging as quickly as possible, without sacrificing safety.

Question 8: If I have fully recharged a battery but not yet used it and reinsert it into the Eco Charger, the LCD display indicates that further recharging is required. Is this correct?

Answer:

Yes. When a battery is first inserted, it is automatically analyzed and tested. After the Eco Charger has established the battery's condition and made sure that it is recharged to its best condition, the recharging process will stop.

Question 9: When should I recharge my Ni-Cd/Ni-MHs?

Answer:

When they are fully discharged.

Question 10: When should I recharge my alkaline batteries?

Answer:

As frequently as possible. The more often you freshen up new batteries, the better the performance. You can get as much as 10 times the normal life expectancy out of a battery. However if a substantial amount of the energy is used in one continuous period of use, even the Eco Charger can't keep it going for much longer.

Make a contribution to the environment: dispose of your used batteries as directed by your local authorities.

ECO CHARGER

INSTRUCTION MANUAL

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Technical Specifications

Safety Information

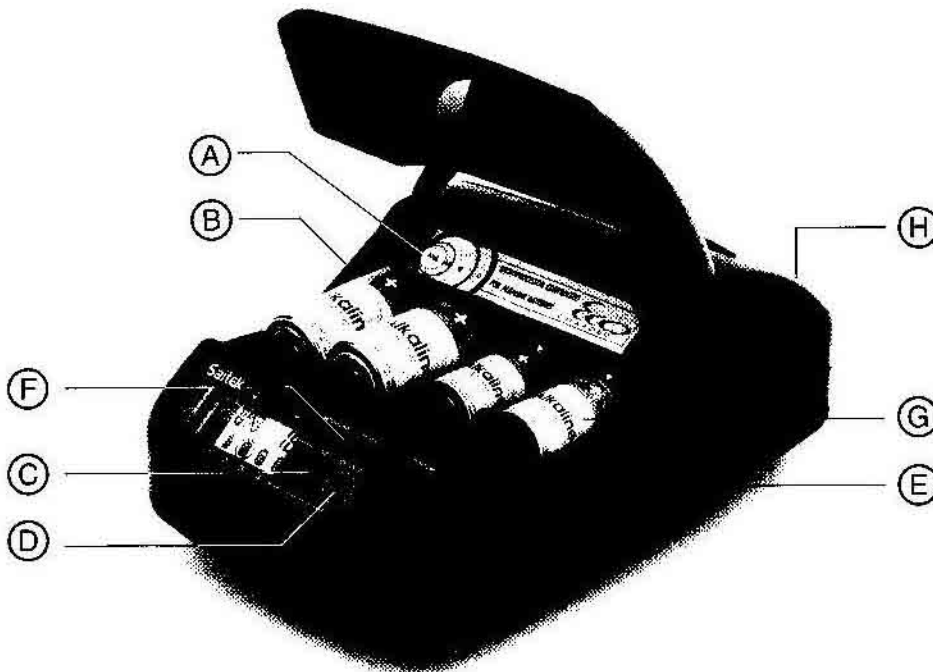
Troubleshooting Guide

Common Questions and Answers

Battery Reference Table

| <u>USA</u> | <u>LCD Display</u> | <u>Europe</u> | <u>Germany</u> |
|--------------------|--------------------|---------------|----------------|
| D - D-cells | □d | LR 20 | Monozelle |
| C - C-cells | □C | LR 14 | Baby |
| AA -penlite | RR | LR 6 | Mignon |
| AAA - mini-penlite | 3R | LR 03 | Micro |

Figure

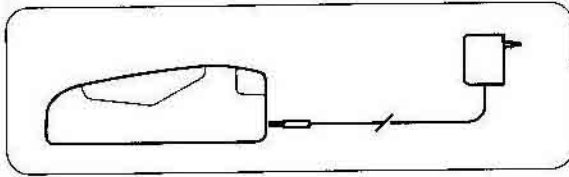


- (A) Battery Size Identification Guide
- (B) AC adapter Socket
- (C) Battery Size Selector. See table above
- (D) CHANNEL: press to begin recharging
During recharging the display

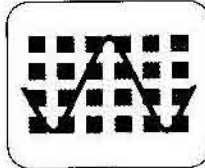
- shows the recharging progress of the battery.
- (E) Open sliding switch
- (F) Battery Type Selector
- (G) Battery Recharging Slots
- (H) Storage Compartment for Batteries

Quick Start

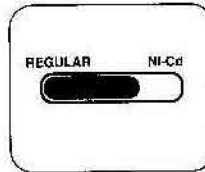
- 1 Plug the AC adapter into a wall socket, then plug the jack into the Eco Charger.



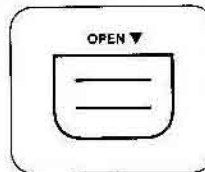
- 2 Wait for the self-test to finish.



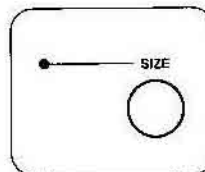
- 3 Select the correct battery type: (rechargeables = Ni-Cd, alkaline batteries = REGULAR)



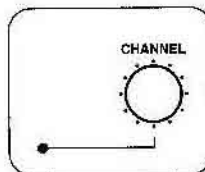
- 4 Open the lid, insert batteries, making sure to observe the correct polarity.



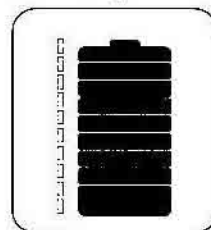
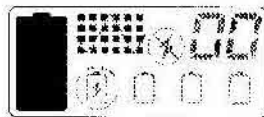
- 5 Press SIZE to select battery size (see Battery Reference Table). Close the lid.



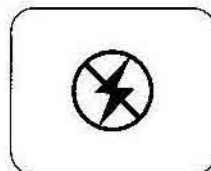
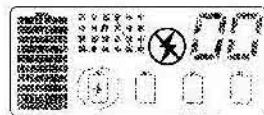
The Eco Charger will start battery analysis a few seconds after the size has been selected. *A shortcut: press CHANNEL after selecting the size to start analysis immediately.*



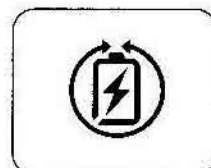
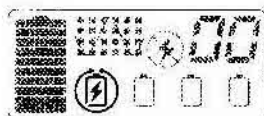
- 6** The Energy Indicator bars on the LCD show the current energy level of each battery.



- 7** Dead batteries: remove and dispose of them



or
Recharged batteries: remove and store.



- 8** Disconnect the AC adapter from the wall socket.* *Ensure there are no batteries remaining in the charger when you switch the power off.*

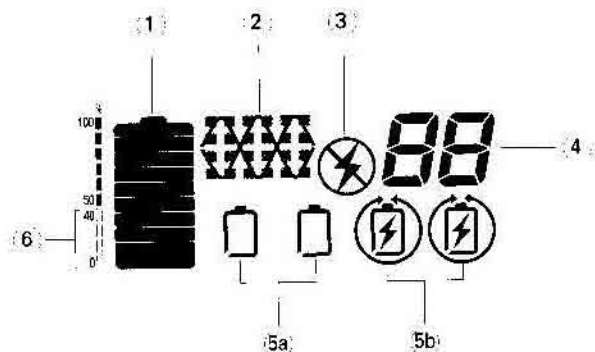
*** Note:**

Ni-Cd/Ni-MH batteries should be used until they are completely discharged. Then they can be recharged and reused until used to the point of exhaustion. The Eco Charger maintains the energy of Ni-Cd/Ni-MHs for an overall longer battery life.

It's a waste to use the energy stored in alkaline batteries only once. The Eco Charger lets you keep fresh alkaline batteries longer if you freshen them up regularly. The heavier the use of the batteries (e.g. remote control cars) the shorter the intervals needed between freshening up the batteries. The lighter the use (e.g. radios, calculators), the longer the period can be between freshening up.

The LCD Display

Illustration and Description



- (1) **Energy Indicator bars:** Visual indication of battery's current energy level. Bottom bar indicates 20% charged; subsequent bars go up 10% at a time while recharging.

Display before recharging:

100% for Ni-Cd = full

100% for alkaline batteries = best possible energy supply achieved, although less energy supply than that of fresh batteries.

- (2) Display of the self test process before recharging
- (3) **Warning symbol:** battery is dead. Immediately take it out of the battery slot and dispose of it.
- (4) **Recharging time/battery size display:** Maximum possible recharging period (in hours) for these batteries. However, recharging often takes less time. LCD shows battery size before recharging (as shown on Battery Reference Table).

- (5) **Battery Symbols:** flashes when the LCD

information corresponds to the battery in that slot.

5.a Battery occupies slot

5.b Charged Battery symbol: battery occupies slot and has finished recharging

- (6) **Low Capacity Indicator:**

Alerts you when the remaining capacity of an alkaline, carbon zinc or zinc chloride battery is below 40%—for such batteries, the efficiency will remain very low, even after recharging .

1. Basic Operation

1.1 Power On.

Plug the AC adapter into a wall socket, then plug its jack into the Eco Charger. Wait for the self test to finish. When the battery symbols flash, the Eco Charger is ready.

1.2 Select the Correct Battery Type.

Choose between REGULAR (alkaline or carbon zinc) batteries or Ni-Cd (Ni-Cd or Ni-MH): you cannot mix them. Slide the switch either to Ni-Cd, or for alkaline batteries to REGULAR.

Note: Do this carefully as the Eco Charger handles Ni-Cd/Ni-MHs and alkaline batteries differently.

1.3 Inspect the Batteries.

Inspect the batteries before inserting. If rusted, oxidised, showing leakage or are otherwise tainted, don't recharge them—dispose of them!

1.4 Insert the Batteries.

Choice of batteries: you can mix all four battery sizes at the same time (but may not recharge Ni-Cd/Ni-MHs and alkaline batteries simultaneously—see section 1.2). You can recharge 1, 2, 3 or 4 batteries simultaneously.

Watch out for plus signs on the batteries: don't insert batteries the wrong way around.

1.5 Setting the Battery Size.

1.5.1 Using batteries which are the same size:

Insert all batteries into the recharging slots. Each battery symbol flashes on the LCD display while the Eco Charger is checking the battery size. If you have inserted an AA battery, the size is automatically set, since the LCD defaults to [AA]. If the battery size is different from the one displayed on the LCD, select the next size displayed by pressing the SIZE button. Sizes appear in this order: $\exists R$ for mini-penlites (AAA), $\exists C$ for C cells, $\exists D$ for D cells and again AA for penlites. The Eco Charger begins battery analysis after ten seconds. You can speed this up by pressing CHANNEL, after selecting the size, to start analysis immediately. If you are not sure of the battery size, check it by holding up your battery against the Battery Size Identification Guide.

1.5.2 Using batteries which are different sizes:

Insert all the batteries into the slots one at a time. Make sure to enter the size for the battery (see section 1.5.1 above) then confirm it by pressing CHANNEL before inserting the next battery.

1.6 Your Batteries are Tested.

If the Eco Charger establishes that a battery is exhausted, defective or can't be tested, it rejects it by sounding a warning tone and displaying the warning symbol \otimes until the battery is removed. If you hear the tone but the warning symbol doesn't flash at this time, press CHANNEL until the symbol flashes. The flashing battery symbol tells you which slot contains the faulty battery. Remove and dispose of it. The warning tone will stop as soon as you remove the faulty battery.

1.7 Charging Begins.

If the batteries are suitable for recharging, the LCD display will show how long it will take to recharge each battery. The Energy Indicator bars indicate how much energy is in the battery during recharging.

The recharging time displayed is the maximum possible. In most cases the Eco Charger will be faster.

1.8 Changes During the Recharging Process.

A) Wrong battery size:

If you realize during recharging that you have entered the wrong battery size, remove the battery and insert it again (or slide back the contact plate for a second to break electrical contact). Then re-select the size and start recharging again.

B) Wrong battery type:

Regular alkaline batteries or Ni-Cd/Ni-MHs: if you set the switch incorrectly, remove all the batteries, set the switch correctly, re-insert the batteries and begin the recharging process again.

If you slide the switch between Ni-Cd and REGULAR while batteries are in place, the Eco Charger will sound a warning tone until the batteries are removed.

Note: Make sure that the setting of this switch is correct: the Eco Charger treats Ni-Cd/Ni-MHs and alkaline batteries differently. If batteries have been recharged with the wrong switch setting or the wrong battery size, it may not be possible in future to regain full performance from the batteries or freshen them up.

1.9 Hear a Warning Tone During Recharging?, Here's Why!

With some batteries, it is only during recharging that the Eco Charger establishes that they can't be safely or adequately recharged. When this happens, the Eco Charger interrupts the recharging process, displays the ☒ warning symbol and sounds the warning tone. Dispose of the faulty batteries.

1.10 Recharging's Finished!

When a battery is fully recharged, the Eco Charger automatically stops the charging process, and the Charged Battery symbol (Ⓢ) is displayed around the battery symbol for the fully charged battery. Simply remove that battery from the unit and it's ready for use!

Result with Ni-Cd/Ni-MHs:

They can last for many more discharge cycles.

Result with Alkaline Batteries:

Freshened up to a certain level, which will however diminish in the course of time. They can no longer store 100% of original energy after being used and recharged. It is best to freshen up alkaline batteries as often as possible, even if they are almost new, for the greatest possible battery life.

You can now use the recharged batteries, or to avoid mistaking them for empty batteries, store them in the rear compartment.

Tip: alkaline batteries lose some of their energy in storage (even in shops). You can get the best performance from them by freshening them up again in the Eco Charger before using them again.

1.11 Switching off the Eco Charger.

First remove all the batteries from the Eco Charger. This maintains the longest possible battery life after recharging, and the Eco Charger is safe from battery leakages or defects. Next, disconnect the AC adapter from the jack, then from the wall socket.

2. Special Characteristics

Built in Microprocessor

Analyses each battery individually and continuously. Thus the Eco Charger accurately determines the remaining strength and provides the required energy to fully recharge each battery, reliably and safely.

Active Charge Monitor

The *Active Charge Monitor* tests and monitors each battery individually, adjusting the charging process to achieve optimal charging every time. It also identifies faulty or unsafe batteries and prompts you to remove them.

Dynamic Load Testing

This tests batteries under conditions similar to actual use, providing very accurate results. This test is much more effective than the simple, standard voltage test performed by many other chargers.

2.1 **Special Advice for Freshening up Alkaline Batteries**

The Eco Charger...

- ... freshens up alkaline batteries
- ... considers each individual battery's energy level
- ... maintains safety standards during recharging
- ... gives batteries additional energy directly before use, if recharged again after storage
- ... can even freshen up regular carbon zinc batteries

2.2 **Facts You Should Know About Alkaline Batteries:**

- ... unlike Ni-Cd/Ni-MHs, they can't be deep discharged and recharged, but must be recharged by regular freshening up.
- ... from the very beginning they have to be freshened up frequently in order to reach their longest life.
- ... mustn't be discharged too deeply at any one time, otherwise it is difficult to freshen them up again.
- ... should be used in heavy drain items first, (e.g. remote control toys) then medium (e.g., cassette recorders) and finally in light drain items.
- ... should be freshened up as frequently as possible.
- ... don't need to be tested regularly by other means. The Eco Charger measures their voltage, just insert them and they recharge automatically.
- ... after usage and freshening up can no longer store 100% of their original energy. But the more frequently they are freshened up, the greater the remaining energy supply.
- ... after they are completely discharged, they can no longer be recharged; they must be disposed of.
- ... can be freshened up over 50 times: the more frequently the better.
- ... should be freshened up regularly in order to prolong their useful lives.
- ... carry a warning against recharging them in Ni-Cd/Ni-MH rechargeable battery rechargers. In these devices there is danger of explosion,
- ... however, they can be safely freshened up with the Eco Charger.