

Battery Charger BT-C700

Operation Instructions



General Information

- The product is intended to charge and discharge NiCad or NiMH rechargeable batteries. It provides four independent charging slots for AA/AAA rechargeable batteries.
- The charger can also optimize and test the maximum capacity of rechargeable batteries. Each charging slot has its own display to show various information, such as, charging current, battery voltage, charged/discharged capacity, battery internal resistance and elapsed charging time.
- The charging current can be selected from 200mA to 1000mA. If 4 batteries are being charged, then the maximum current for each slot will be limited to 700mA. If there is no battery in slots 2 or 3, then the maximum current in slot 1 and 4 can be selected up to 1000mA.
- The charger can charge simultaneously batteries of different types and sizes and with different capacity. It also includes the Minus Delta Voltage ($-\Delta V$) function, which monitors the voltage over the charging cycle. When a battery is fully charged, the charger will switch to trickle charging automatically. Therefore the battery will be kept at its optimum capacity.

- The charger includes overheat detection to protect rechargeable batteries and charger itself from overheating. Specially design improved charging circuit provides excellent heating management during high current charging processes, which assures the best charging condition for batteries.
- The charger can only be powered with a power supply rated 12v/1.0A.
- Operate and store it only in a dry indoor environment.
- This product fulfills European and German requirements related to electromagnetic compatibility (EMC).
- CE conformity has been verified and the relevant statements are available upon request.
- Unauthorized conversion and/or modification of the device are inadmissible because of safety and approval reasons (CE).
- Any usage other than described in this manual is not permitted and can damage the product and lead to associated risks such as short-circuit, fire, electric shock, etc.
- Please read the operating instructions thoroughly and keep them for future reference.
- The charger has its backlight turned on after each keypress. Back light will be switched off after 30 seconds when no key is pressed.
- The maximum charging capacity can be up to 20,000mAH.

Scope of Delivery

- Battery Charger BT-C700 (Image 1) 1 pcs.
- Power Adapter 12V / 1A (Image 2) 1 pcs.
- Operation Instructions 1 pcs.
- Optional: 12V charging cable 1 Pcs.



Image 1



Image 2

Power Supply

- The shipped power adapter is the power supply for this charger.
- In case you need to use other power adapter, please be aware that power supply has the correct polarity plug. Also please be noted that power supply needs to be able to supply minimum 1.0A current. Low output power adapter could lead to malfunctions.
- When the charger is powered up, version number will be displayed for 2 seconds. Then all LCD segments will light up momentarily, and “null” will be shown until any batteries are inserted (image 3).

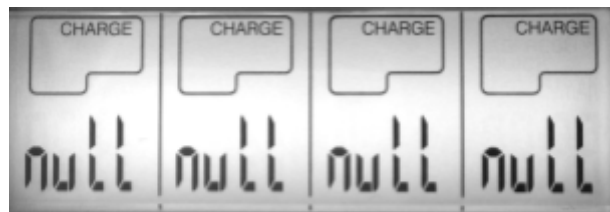


Image 3

Operation

Once a rechargeable battery is inserted, its present voltage (for example: “1.12V”) will be displayed for 3 seconds, then 400mA default charging current will be shown on display for another 3 seconds (Image 4)

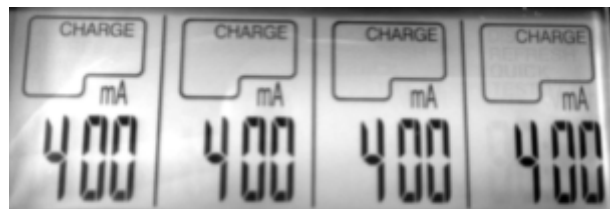


Image 4

If MODE or CURRENT button (image 5) is **not** pressed during these 6 seconds, the charging process will start. During the first 6 second time, if any button is pressed, the unit will wait for another 10 seconds, during which you can set up the current slot to the desired operation mode (see below).

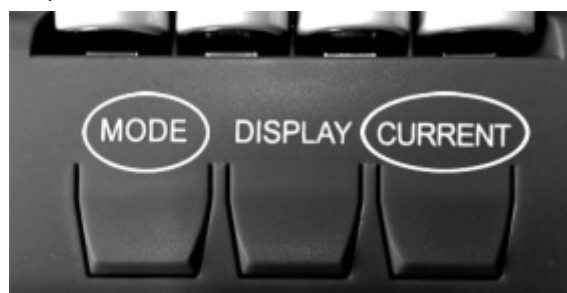


Image 5

Once the first battery working mode has been entered (the display stops flashing) the next battery can be inserted and the desired working mode can be chosen accordingly.

When the previous battery slot setting mode is not yet effective (telling by the flashing display of that battery slot LCD), and the next battery is being inserted, then both battery slot displays will be flashing, which means that **any setting change will be applied to all batteries** at the same time.

Once normal working mode starts, charging current or working mode can no longer be changed, until batteries are taken out from the charger and inserted again, or the MODE button is pressed for longer than 2 seconds.

During normal working mode, pressing the DISPLAY button will toggle display mode between battery voltage, working current, elapsed time for all slots which are currently in working progress. Each button pressed will turn on a back light for 30 seconds.

Operation Mode Selection

- Press and hold the MODE button for 2 seconds to start working mode selection for all four battery slots.
- Press the MODE button subsequently to toggle between the CHARGE, DISCHARGE, TEST, QUICK TEST and REFRESH modes (Image 6)



Image 6: The 5 different operation modes

- When a particular slot working mode needs to be changed, detach the battery from the charger and insert it into the slot again, while that selected slot LCD display content is flashing, press MODE button to choose the desired operation mode.
- When an operation mode is changed, working current adjustment is possible also.

Current Selection

Within the first 6 seconds after inserting the battery or right after power up, press the CURRENT button to select the desired charging current for slot(s) currently loaded with a battery/batteries.

Current setting can not be changed once the setting had been confirmed and the charging/discharging process has begun. If a different working current is required afterwards, either change the operation mode, or pull out the battery from its slot and insert it again.

Discharging current is automatically set to predefined charging current.

Attention: For the batteries in slots 1 and 4 (no batteries in slot 2 or 3 and the display shows “null” - see image 7) the charging current can be selected up to 1000mA. The charging current for slots 2 and 3 is limited to a maximum of 700mA.

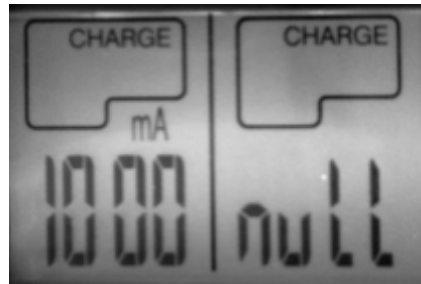


Image 7

Display Selection

The DISPLAY button is for toggling between the different display informations: voltage, current, capacity, work time etc.



Image 8

Operation Modes and Display

Operation Modes

- **CHARGE Mode:** The rechargeable battery is charged up to its maximum capacity. Accumulated charging capacity is displayed at mAh.
- **DISCHARGE Mode:** This mode is used to reduce the memory effect. The rechargeable battery is discharged to a preset battery voltage (0.9V). Once the discharge is finished, the total accumulated discharging capacity will be displayed at mAh, showing how much energy is discharged from the battery, which is always referring to the accumulated discharging capacity. No trickle charge current will be applied after discharge cycle is finished.
- **REFRESH Mode:** The rechargeable battery is charged and discharged repeatedly to optimize to its maximum capacity. Old batteries or batteries that have not been used for a long period of time can be restored to their rated capacity. Depends on the selected charge current and battery impedance, it can take tens hours or even days

before complete. Refresh mode will make 3 complete discharging-charging cycles before complete. After the discharging cycle is complete, the total discharged capacity will be displayed in mAh. When its current working cycle is in charging state, the mAh display is always referring to last discharging cycle for its charged capacity.

- **TEST mode:** This mode checks the present capacity of a rechargeable battery. The maximum capacity is determined by discharging the rechargeable battery after it was fully charged. If the maximum capacity is much lower than the rated capacity then the battery may have reached the end of its lifetime.
- **QUICK TEST mode:** The charger will analyze the dynamic internal resistance of the battery by applying a load current and reading it while referring to the voltage drop detected on the battery. Within 10 seconds, the tested battery resistance will be displayed in the unit of milliohm

Note that batteries of good quality have a low internal resistance in the range of 20 ~ 80 milliohms (image 9).

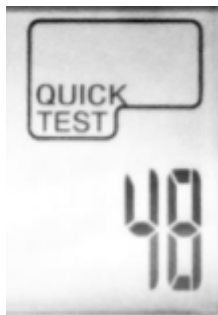


Image 9

If the internal resistance is over 500 milliohms, it means these batteries are not sufficient for supplying power to high current loads, such as digital cameras etc. However, they can still be used for low energy loads, such as clocks, remote controllers etc. Always use batteries with more or less similar internal resistance when they are used in serial to achieve maximum battery life.

Alkaline and other 1.5V batteries can be tested on this charger as well. If a completely empty battery is to be tested, it is not possible to give any correct reading. Please note that since the internal battery resistance can be very low, and contact resistance can be a major influence factor, thus same battery tested in different slot or even at the same slot with different contact condition, the reading can be varied for 10% to 20%. This is normal.

When a high impedance battery (e.g. over 2500 milliohm) is loaded onto the charger, due to its high internal impedance, real displayed charging current can be much less than your pre-selected charging current. When this happens, it doesn't mean that the charger is defective. Eventually it needs a longer charging time until fully charged.

Display

- **Charge/Discharge Current:** instantaneous current is displayed.
- **Time Elapsed:** The charging/discharging time of the last cycle is displayed.
- **Accumulated Capacity:** The accumulated battery capacity is displayed in mAh. For DISCHARGE mode, it is referring to the accumulated energy discharged from that battery. For REFRESH mode, previous charging capacity is displayed even when current working stage is at discharge cycle.
- **Battery Voltage:** The instantaneous battery voltage is displayed.
- At **QUICK TEST** mode, it shows the internal battery resistance in milliohm (0.001R) (see image 9 above).
- **Full:** After the rechargeable battery is fully charged in any of the operation modes, trickle charging will start automatically. Trickle charging prevents the rechargeable batteries from being overcharged and compensates for self-discharging of the batteries.

Technical Specifications

- Input Voltage: 12V-16VDC
- Power Supply
 - Input: 100-240V-,50/60Hz
 - Output: 12V DC, 1.0A
- Charging Current Range: 200, 300, 400, 500 700, 1000 mA
- Maximal Charging Capacity: 20000 mA
- Operation Temperatures: 0 – 40°C

Maintenance

The device requires no particular maintenance, but should be cleaned occasionally. When cleaning, the device must be disconnected from any power source. Use dry and soft cloth only to clean the housing of the charger. Do not use abrasive or solvents.

Disposal

Disposal of waste electrical and electronic equipment

In order to preserve, protect and improve the quality of the environment, protect human health and utilize natural resources prudently and rationally, the user should return unserviceable products to relevant facilities in accordance with statutory regulations.

The crossed-out wheeled bin indicates that the product needs to be disposed separately and not as municipal waste.

Disposal of used batteries

The user is legally obliged (battery regulation) to return used batteries and rechargeable batteries. **Disposing used batteries in the household waste is strictly prohibited!** Batteries/rechargeable batteries containing hazardous substances are marked with the crossed-out wheeled bin. The symbol indicates that the product is forbidden to be disposed via the domestic refuse. The chemical symbols for the respective hazardous substances are Cd= Cadmium, Hg = Mercury, Pb = Lead. You can return used batteries/rechargeable batteries free of charge to any collecting point of your local authority.

Safety Instructions

- We do not assume liability for resulting damages to property or personal injury if the product has been abused in any way or damaged by improper use or failure to observe these operating instructions. The warranty will then expire!
- The product must not be exposed to substantial mechanical strain or strong vibrations.
- The product must be protected against electromagnetic fields, static electrical fields, extreme temperatures, direct sunlight and moisture
- The manufacturer's instruction for the respective batteries must be observed, before they are charged.
- The product should not be connected immediately after it has been brought from an area of cold temperature to an area of warm temperature. Condensed water might damage or even destroy the product. Wait until the product adapts to the new ambient temperature before use.
- Sufficient ventilation is essential when operating the charger. Never cover the ventilating slots of the charger.
- Please take precautions especially when ambient temperature is over 35 degrees Celsius and charging current rate is over 0.5C. If higher charging current applied, it is easier to build up temperature on batteries.
- Correct polarity must be observed while inserting the batteries.
- Non-rechargeable batteries, rechargeable alkaline batteries (RAM), **lead acid batteries and lithium batteries must not be charged with this product. There is danger of explosion!**
- Batteries should be removed from the device if it is not used for a long period of time to avoid damage through leaking. Leaking or damaged batteries might cause acid burns when in contact with skin, therefore use suitable protective gloves to handle corrupted batteries.
- Batteries must be kept out of the reach of children. Do not leave the battery lying around, as there is risk, that children or pets swallow it.
- Batteries must not be dismantled, short-circuited or thrown into fire.
- Never recharge non-rechargeable batteries. There is a risk of explosion!
- Repair works must only be carried out by a specialist/specialist workshop.
- If you have queries about handling the device, which are not answered in this operating instruction, please check with the distributor for further help.

Distributor's Details

ENERpower is a brand of ENERdan GmbH
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More Information and products at www.enerpower.de