

OPERATING INSTRUCTIONS

Battery Charger BT-C100



1. Intended Use

The product is intended to charge and discharge NiCad, NiMH, LiFeO₄, Li-ion 3.7v and Li-ion 3.85v rechargeable batteries. When Li-ion battery is in charger, it is possible to turn USB output on with 5v/2.1A output. USB output can detect device type connected and having 1.0A, 1.5A and 2.1A driving capability. USB power parameters, like voltage, current and Ampere-Hour value are displayed on LCD. USB power line display data displayed on BT-C100 is useful for evaluating your device battery healthy state: How many AH needed to fully charge the device and it is easy to tell the energy needed for fully charging has decreased significantly when battery life is reaching its life time.

When battery voltage is less than 3.1v or load current is over 2.5A, BT-C100 will automatically shutdown USB output to protect battery from draining up completely. When there is no DC power connected, charger can get power from Li-ion battery, but not possible to operate by itself with 1.2v rechargeable battery mounted.

BT-C100 is an analyzing charger, it measures rechargeable battery parameters, such as battery impedance, battery capacity (mAh charged or discharged), battery voltage and elapsed working time.

Charging current can be selected from 200mA to 2000mA for 1.2V type Nimh battery, and for Li-ion batteries, maximum charging current is 1600mA. when 5v power is connected, charger will limit Li-ion battery charging current to 1000mA automatically.

Discharging current can be selected from 100mA to 1000mA for NimH battery, Li-ion battery discharging current is limited to 700mA due to heat control safety reason.

During Li-ion battery charging state, if USB output is turned on, then displayed mAh data can be much higher than battery capacity, this is due to part of charging current is bypassed to USB output circuit. Please be aware this and it is not charger wrong for its displayed mAh data not matching battery rating capacity..

Charger will automatically reduce 500mA working current when over heat is sensed (over 80C) during charging or discharging state. It will resume full working current until temperature is lower than 50C degrees sensed.

When charging NiMH or NiCd battery with its impedance larger than 250mR, then maximum charging current will be limited to 1.0A to keep battery not overheated during high current charging period. For those batteries with high internal impedance, charging current will build heat inside battery and the purpose of this behavior is to reduce heat generated during charging and it is good in keeping battery relatively cool during the charging cycle.

The charger can only be powered by power supply rated 12v/1.0A or Micro USB 5.0v/2.0A or li-ion battery itself with voltage higher than 3.1v..

The charger has its backlight turned after power is connected or li-ion battery mounted. Back light can't be switched off.

This product fulfills European and national 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 above 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.

Maximum charging capacity can be up to 20,000mAh or maximum cycle working time is over 100 Hours.

2. Delivery Content

| | | |
|--------------------------|---------|------|
| Battery Charger | BT-C100 | 1pcs |
| Power Adapter (optional) | | 1pcs |
| Operation Instructions | | 1pcs |

Optional accessory Part:



3. 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!

3.1 Product Safety

- 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 destroy the product. Wait until the product adapts to the new ambient temperature before use.

Sufficient ventilation is essential when operating the charger. Never

- 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.

4. Operation

Once a rechargeable battery is inserted, battery voltage (for example, "1.12v") will be displayed. If **MODE** or **CURRENT** button is not pressed,

cover the ventilating slots of the charger.

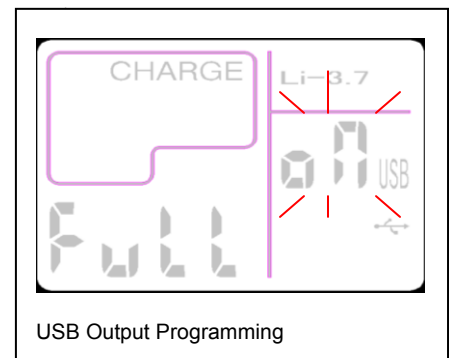
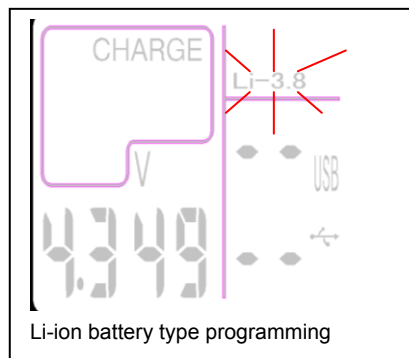
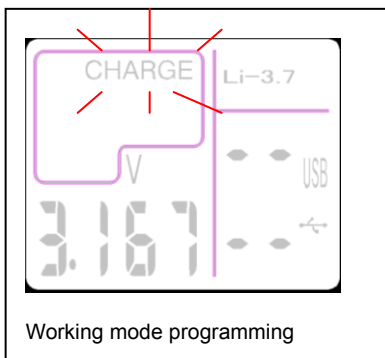
3.2 Battery Safety

- 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 reach of children. Do not leave the battery lying around, as there is risk, that children or pets swallow it.
- When charging current more than 1.0A is selected for charging, charger should not be left unattended in house. Though charger provides overheat protection, but some defects is not controllable by charger itself. There should have people around during charging.

Batteries must not be dismantled, short-circuited or thrown into fire. Never recharge non-rechargeable batteries. There is a risk of explosion!

3.2 Miscellaneous

BT-C100 charger will start the working mode in 10seconds. If **Current** button is pressed to select different working current, then 3 seconds after key operation, charger will start the working mode. For those batteries with impedance higher than 250mR, charger can only accept charging current not larger than 1.0A due to safety consideration reason.



Hold **MODE** button longer than 2s, will activate mode selection process. Current can be changed only when mode selection routine is activated.

Hold **MODE** button longer than 6s, will activate li-ion battery type programming mode: press MODE button to toggle between LiFeO₄, Li-3.7 and Li-3.8.

Hold **CURRENT** button longer than 2s (Li-ion battery must need to be mounted in battery slot) , will activate USB output on/off process. Short press to toggle between USB output on/off state.

5. Operation Modes and Display

5.1 Charger Operation Modes:

- Charge Mode: The rechargeable battery is charged up to its maximum capacity. Accumulated charging capacity is displayed at mA display mode.
- Discharge Mode: It is used to reduce the memory effect. The rechargeable battery is discharged to a preset battery voltage (0.9v). Once discharge is finished, total accumulated discharging capacity is displayed at mA display mode, 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 rechargeable batteries or rechargeable 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 time before complete. Refresh mode will make 3 complete discharge-charge working cycles before complete. After discharge cycle is complete, the total discharged capacity will be displayed in mA display mode. When its current working cycle is in charging state, the mA display is always referring to last discharging cycle for its charged capacity..
- Test 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 it may reach the end of its lifetime.
- Impedance Test mode: The charger will analyze the dynamic internal battery resistance by applying a load current and this current reading is referred to the voltage drop detected on the battery. Within 10s, the tested battery resistance will be

displayed in the unit of milliohm. For good quality batteries, the internal resistance is very low: in the range of 20 ~ 80 milliohms. If battery internal resistance is over 500milliohms, then these batteries are not good for supplying power to high current loads, such as digital camera etc. But they can still be used for low energy loads, such as clock, remote controllers etc. Always use batteries with close internal resistance range when they are used in serial to achieve maximum battery life. Alkaline and any 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 be noted that since the internal battery resistance can be very small, 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 2500milli ohm) 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 happened, it doesn't mean the charger is defective. Eventually it needs longer charging time until fully charged.

5.2 USB OUTPUT MODE

Press "CURRENT" button to turn on/off USB output. When USB output is at ON state, press "CURRENT" button to toggle display between current and AH.

5.3 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 IMPEDANCE TEST mode, it shows the internal battery resistance in milli- ohm(0.001R).
- Full: After the rechargeable battery is fully charged in any of the operation modes, trickle charging will be started automatically. Trickle charging prevents the rechargeable batteries from being overcharged and compensates for self-discharging of the batteries

6. Maintenance

The device is maintenance-free but should be cleaned occasionally. When cleaning, the device must be removed from any power source. Only use dry and soft cloth to clear the housing of the charger. Do not use abrasive or solvents.

7. Disposal

7.1 Disposal of waste electrical and electronic equipment

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

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



7.2 Used batteries/rechargeable batteries disposal

8. Technical Data

The user is legally obliged (battery regulation) to return used batteries and rechargeable batteries. Disposing used batteries in the household waste is 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.



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|---------------------------|------------------------------------------------------|--------------------|
| Operating Voltage | 5v, 12V ~16VDC | |
| Power Adapter | Input: | 100~240V~, 50/60Hz |
| | Output: | 12V DC, 1.0A |
| Charging Current range | 200,300, 500,700,1000,1300,1600, 2000 (nimh only) mA | |
| Discharging Current range | 100,200,300,400,500,600,700,1000(nimh only) mA | |
| Max. Charging Capacity | 20000mAh or 100H charging | |
| Operating Temperature | 0 to 50 °C | |
| USB | 5V, 0 ~ 2.1A auto detect mode | |

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