



Intelligent NiMH/NiCd Battery Charger  
**TN455**

**USER'S MANUAL**

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# Tenergy 4-Bay NiMH/NiCd Intelligent Charger with Backlit LCD, TN455

Tenergy's TN455 is an intelligent charger designed for AA and AAA NiMH/NiCd batteries.

TN455 offers multiple operation modes based on your needs (charge, test, refresh, discharge/charge). Its backlit LCD allows you to see the charging status in real time, including the charging current, battery voltage, measured capacity, as well as the elapsed time.

Parameter	Value
Input Voltage	DC 12V /1.5A
Power Consumption	12W-max
Supported Battery Types	NiMH, NiCd; AA & AAA size
Number of Charging Slots	4 (independent channels)
Charge current	200mA, 500mA, 700mA, 1000mA
Discharge current	100 mA, 250 mA, 350 mA, 500mA
Charging Method	-dV
Protection against battery overheating	Yes
Protection against memory effect (NiCd)	Yes
Device operation modes	Charging; discharging; refresh; testing
Backlit LCD	Yes
USB output	Yes

Please carefully read the following instructions before use.

## OPERATING INSTRUCTIONS

### 1 Intended Use

The product is designed for use with NiMH or NiCd rechargeable batteries. It provides four independent charging slots for AA / AAA size batteries. This charger can also optimize and test the maximum capacity of your rechargeable batteries. Each charging slot has its own display to show various information, such as charging current, battery voltage, charged capacity, and elapsed time.

The charging current can be selected from 200 mA, 500 mA, 700 mA and 1000 mA. Batteries of different types (NiMH/NiCd) and sizes (AA/AAA) with different capacities can be charged at the same time. This charger uses the minus delta voltage ( $-\Delta V$ ) function to determine the charging status. 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 also has built-in overheat detection to protect rechargeable batteries and charger itself from getting too hot during use. The charger can only be used with the original power supply included with this charger.

Please operate and store this charger in dry, indoor environment only. This product

fulfills European and national requirements related to electromagnetic compatibility (EMC). CE conformity has been verified, and manufacturer's compliance statement is available upon request. Unauthorized conversion and/or modification of device prohibited and will void the warranty. Any usage other than described above is not permitted and can damage the product, leading to associated risks such as short-circuit, fire, electric shock, etc. Please read the operating instructions thoroughly and keep them for future reference.

## **2 Package Contents**

- Tenergy TN455 Charger x 1
- Power Adapter x 1
- User Manual x 1

## **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 .

### **3.1 Product Safety**

This product must not be exposed to substantial mechanical strain or strong vibrations.

This product must be protected against electromagnetic fields, static electrical fields, extreme temperatures, direct sunlight and moisture.

The manufacturer's instructions for the batteries must be observed, before they are used with this charger.

This product should not be connected immediately after it has been brought from an area of cold temperature to an area of warm temperature, as condensed water may damage 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 charger during use. Please note that when ambient temperature is over 35 degrees Celsius, the device's overheat protection may be triggered easily, and thus longer charging time will be needed.

### **3.2 Battery safety**

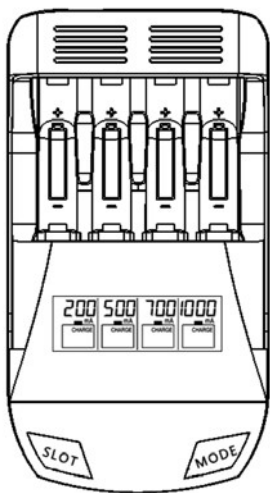
Correct polarity must be observed while inserting the batteries.

Non-rechargeable batteries, rechargeable alkaline batteries (RAM), lead acid batteries and lithium batteries must not be charged with this product.

Batteries should be removed from the device if it is not used for a long period of time to prevent damage through battery leaking. Leaking or damaged batteries might cause acid burns when they come contact with the skin, therefore please use suitable protective gloves to handle damaged batteries.

Batteries must not be dismantled, short-circuited or thrown into fire. Never recharge non-rechargeable batteries as it may lead to explosion.

If you have any queries about the device that are not answered user manual, please check with the distributor or manufacturer for further help.



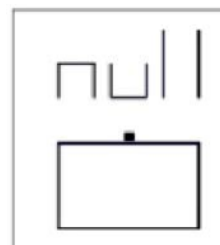
## 4. Operating Elements

**MODE Select Button:** Lets you select the operation mode (Dcharge, Discharge, Refresh, Test) when batteries are first inserted, or reset the mode selection (hold and press for more than 1 sec) when the charger is in operation.

**CURRENT Button:** Lets you select the charging current when batteries are first inserted, or cycle through the status display options once the charger is in operation.

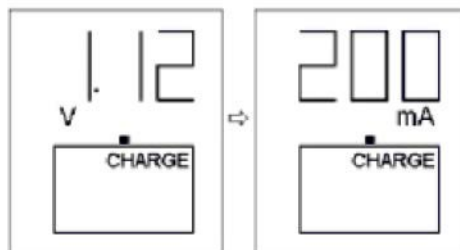
## 5. Power Supply

Only the power adapter included with the charger is allowed to be used. When the charger is powered up, all LCD segments will light up momentarily. The “null” icon will be shown in the LCD display for each slot, until a battery has been detected. When the charger is powered up, its USB output can be used to charge your portable devices regardless whether there are batteries in the charger.

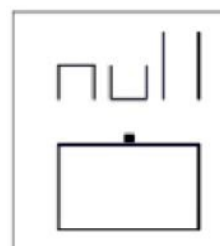


## 6. Operation

Once a rechargeable battery is inserted, its present voltage (for example, “1.2v”) will be displayed for 4 seconds, then “**200mA Charge**” will be shown on display for another 4 seconds as the default charging current/operation. If the MODE or CURRENT button is not pressed during these 8 seconds, the charging process will start.



To change the charging current and/or operation mode, press and hold the Mode Select button for 1 second. After which the next available operation mode will be shown, and you can continue to press MODE to select other functions, or press CURRENT to change the charge/discharge current.



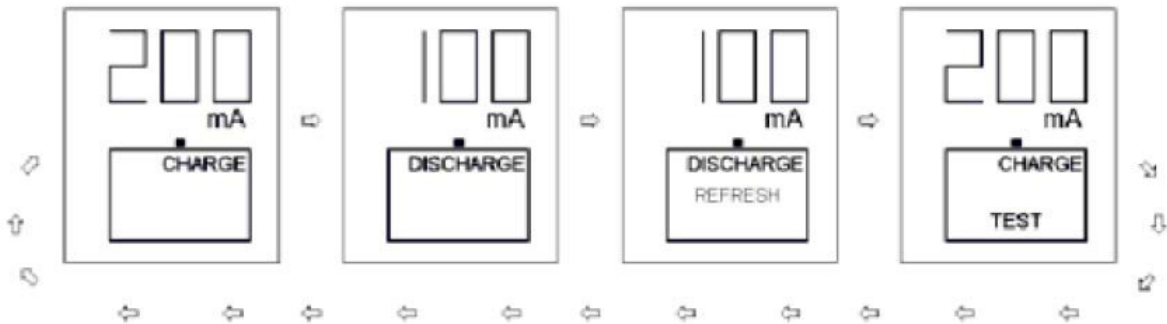
If batteries that are damaged or defective are inserted into the charger, the “null” icon will be displayed on the display and the charger will refuse to charge them.

### 6.1 Mode Selection

Press and hold MODE for 1 second to change the operating mode for all charging slots. Press the : MODE button subsequently to toggle among the “Charge”,

“Discharge”, “Test” and “Refresh” operation modes.

After selecting the mode you can change the charging/discharging current pressing CURRENT.

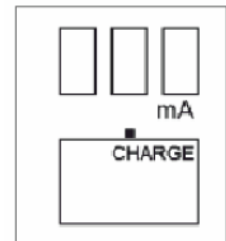


## 6.2 Current selection

Within the first 8 seconds after inserting the batteries, press the CURRENT button to select desired charge current (200, 500, 700, 1000mA) or discharge current (100, 250, 350, 500). If no button is pressed for 4 seconds, the chosen operation mode will begin. After that, the charging current and / or operation mode can be changed by pressing and holding MODE for 1 second.

## 7. Overheat protection

Overheating can be detected by the charger, when either battery temperature is above 55°C / 131°F, or the charger's internal temperature is above 70°C / 158°F. When that happens, the current charging or discharging process will be paused immediately, and the charging or discharging current display will show “000mA”. The charger will only resume its operation once the temperature of the rechargeable batteries drops below 40°C / 104°F and charger controller board drops below 50°C / 122°F. This feature is extremely important in protecting the batteries or charger itself from overheating.

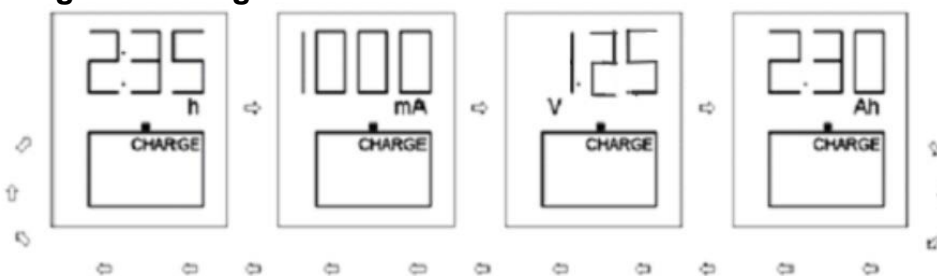


## 8. Operation Modes and Display

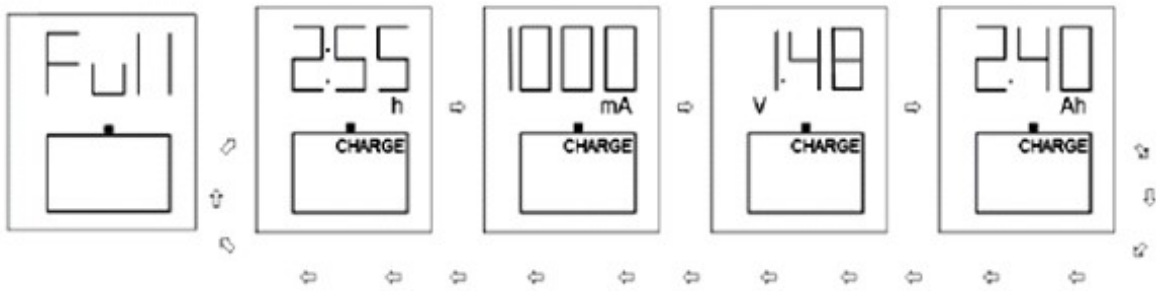
### 8.1 Operation Mode

**Charge Mode:** In Charge Mode, your battery is charged up to its maximum capacity.

#### Stage1 Charge

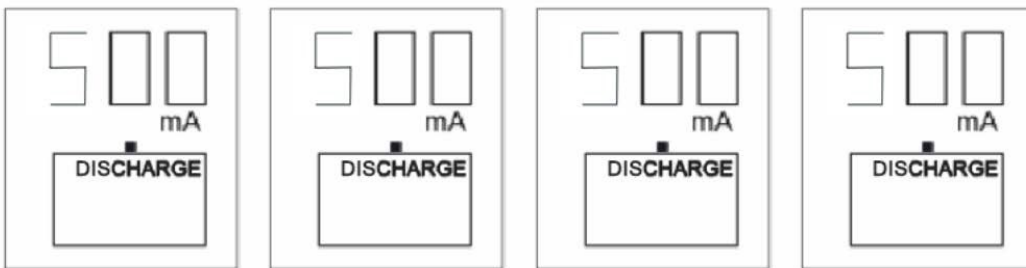


**Stage 2** Charge over, trickle charge begins.

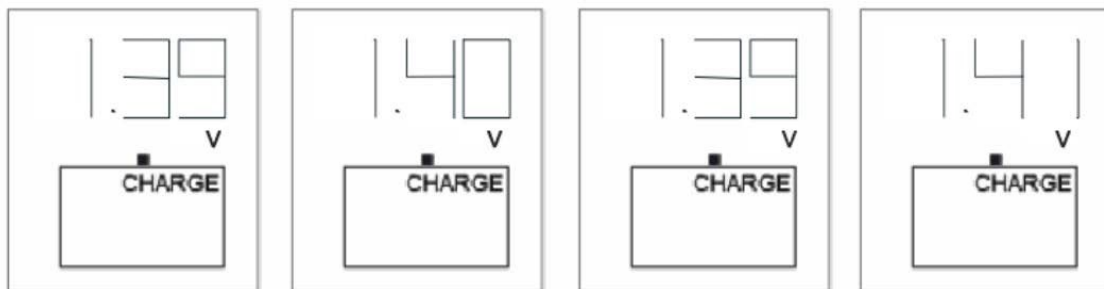


**Discharge Mode:** The Discharge Mode is used to reduce the memory effect. The rechargeable battery is discharged to a preset battery voltage (0.9V). Once a battery has been discharged, it will be charged at the pre-selected charging current. Discharging current is always half of the charging current.

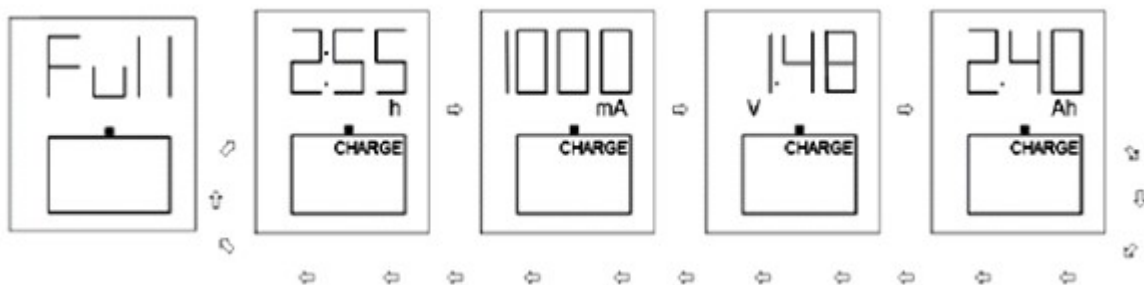
**Stage 1 Discharge**



**Stage2 Charge.**

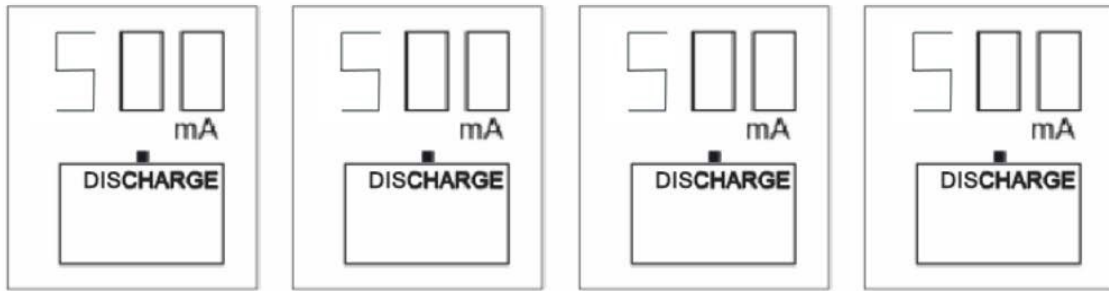


**Stage3 Charge over, trickle charge.**

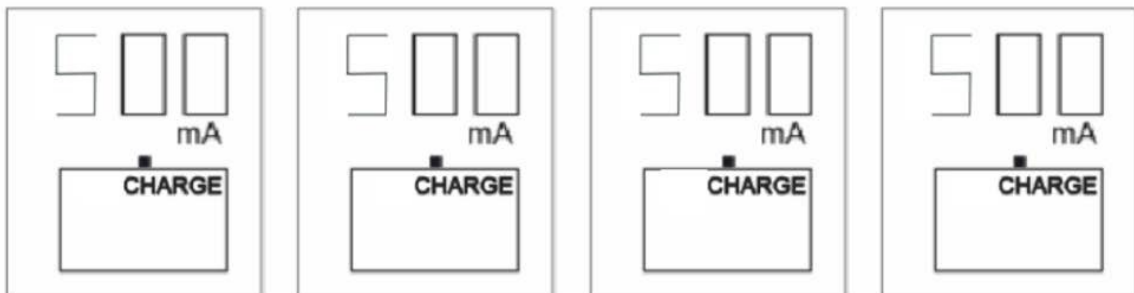


**Refresh Mode:** With the Refresh Mode, the battery is charged and discharged repeatedly to optimize to its maximum capacity. Old rechargeable batteries that have not been used for a long period of time can be restored to their rated capacity. Depends on the selected charge current, it can take hours or even days before completion.

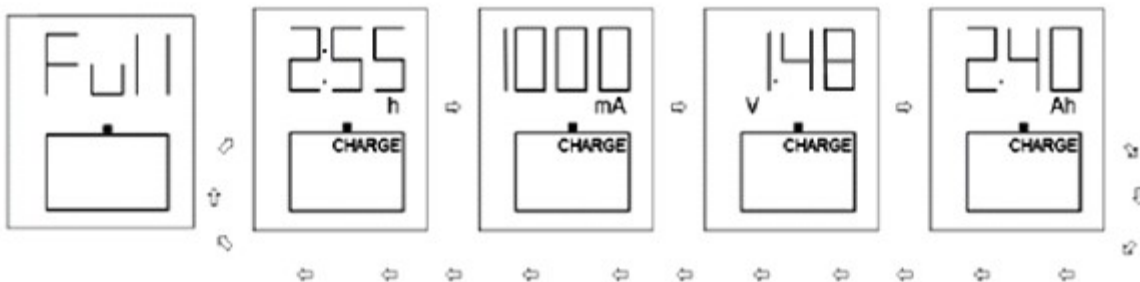
**Stage 1 Discharge.**



**Stage 2 Charge**

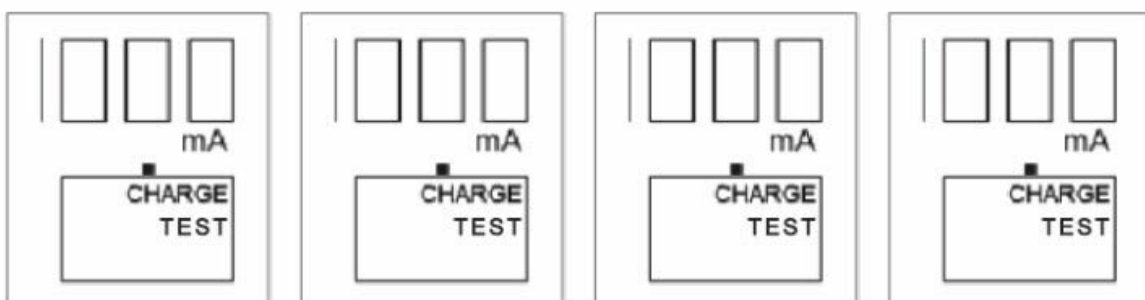


**Stage 3 The refresh process is over, trickle charge begins**



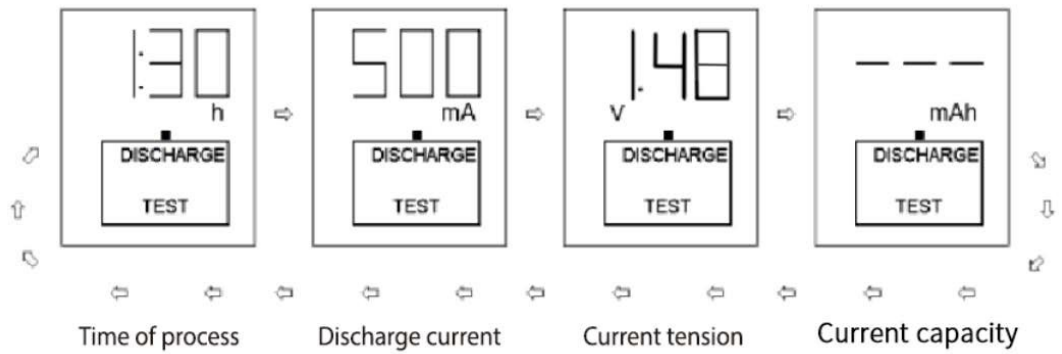
**Test Mode:** In Test Mode, the charger can measure a battery's capacity. The maximum capacity is determined by discharging the rechargeable battery after it has been fully charged. If the maximum capacity is much lower than the rated capacity, then it may have reached the end of its cycle life.

**Stage 1 Charge.**

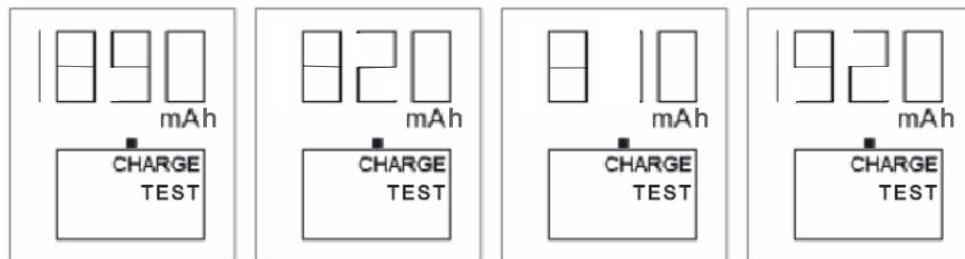




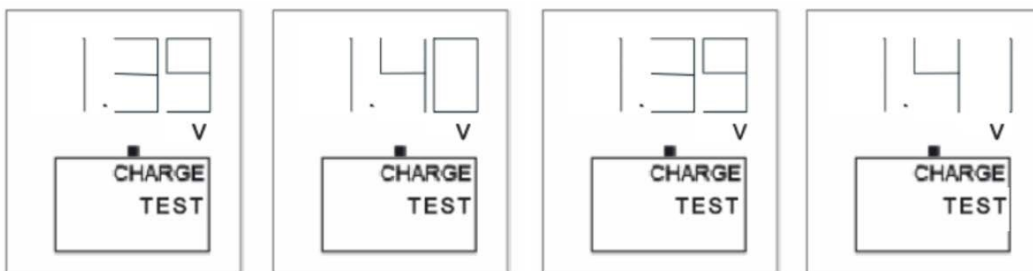
**Stage 2 Discharge.**



**Stage 3 Discharge over, the second charge current selected.**



**Stage 4 The testing process is over, trickle charge begins.**



## 8.2 Display

- Charge/Discharge current: Shows the present charge/discharge current setting.
- Elapsed Time\*: The charging/discharging time of the last cycle is displayed.
- Accumulated capacity: The accumulated battery capacity is displayed in mAh.
- Charge voltage: The instantaneous battery voltage is displayed.
- Full: After a battery has been fully charged, the status icon would read "Full", and the charger will switch to trickle charging. Trickle charging is a very small charging current that compensates for self-discharging of your fully charged batteries, without the risk of overheating or overcharging.

\*Once the the elapsed time has reached 19 hours and 59 minutes, the timer will reset and begin counting from 0:00 again.

## 9. 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 housing of the charger. Do not use abrasive or solvents.

**10. Dispose of electrical** and electronic waste properly in order to preserve, protect and improve the quality of environment, and protect human. Please return unserviceable product to relevant facilities in accordance with statutory regulations.

## Warning

- This battery charger can only charge NiMH/NiCd batteries.
- Please read the specifications carefully before use, and pay close attention to the recommended charging current. Do not select charging current higher than the recommended settings.
- Please don't use this charger with other power adapters.
- The charger's temperature may increase significantly during operation. Please use it in a well-ventilated area.
- Please unplug the power supply and remove your batteries from the charger's charging slots when the charger is not in use.
- The battery data displayed by this product is just for your reference only, and may differ from those measured with a professional equipment.