



OPERATION
CHARGING AA AND AAA BATTERIES

LCD RAPID BATTERY CHARGER / DISCHARGER WITH USB OUTPUT
MD-1600L USER'S MANUAL- Please read before using this equipment.

Thank you for purchasing the Titanium Innovations MD-1600L Universal LCD Battery Charger / Discharger with USB Output. You can fully charge up to 16 AA or AAA Nickel Metal Hydride (Ni-MH) batteries in any configuration.

The MD-1600L's state-of-the-art design with its LCD monitoring ensures that you know which batteries are ready and which need more time to charge. No more guessing!

The MD-1600L's 16 charge banks truly empower you to use Ni-MH rechargeable batteries for all your needs. Ni-MH batteries are the most economical and environmentally-friendly portable power source available.

Ni-MH batteries can be charged up to 500 or even 1000 times, and provide great performance for high-drain devices. The included universal 100-240V AC and 12-24V DC power adapters are perfect for traveling and charging anywhere life take you.

Features:

- 16 Charging Indicators:** 16 individual LCD indicators show the charge state of each battery.
- Two USB Sockets:** Provides 5V 500mA of power to charge your USB devices.
- Patented Technology:** Allows you to charge different size or capacity batteries simultaneously.
- Automatic Charge Current Selection:** Automatically selects the ideal charging current for AA and AAA batteries.
- Reverse Polarity Protection, Alkaline and Bad Battery Protection:** Protects your batteries and the charger from damage when misused.
- Automatic Timer Shut-Off:** The special automatic shut-off timer is a safety feature that will keep your batteries from being overcharged.
- AC Adapter and DC Cord:** Powered by an external AC adapter for indoor use or by a 12V DC cigarette lighter plug when you are traveling.
- Microprocessor Controlled:** Intelligent microprocessor-based controller manages charge, discharge, and cell protection functions.
- Delta Voltage Detection:** Maximizes the charge and performance of your batteries.
- Discharge Function:** Refreshes and renews your batteries to ensure the deepest and fullest charge. 4 separate 'bays' allow you to refresh some batteries while charging others.
- Short Circuit Protection:** Protects your battery charger from damage.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THIS INSTRUCTION!

Be sure to observe the following important precautions when using the MD-1600L. All references in this manual to "the adapter" and "the charger" refer to the MD-1600L.

- Never try to open the case of the charger or attempt your own repairs or modifications. The high-voltage internal components can cause electrical shock when exposed.
- Keep the charger and adapter away from water and other liquids, and never let them get wet. Moisture may cause fire or electrical shock.
- Should you ever notice smoke or a strange odor coming out of the charger, immediately unplug the AC adapter from the outlet. Using the charger under these conditions may cause fire or electrical shock.
- Unplug the AC adapter from the power outlet and clean the area around the prongs of the plug when needed. Dust around the prongs can cause fire.

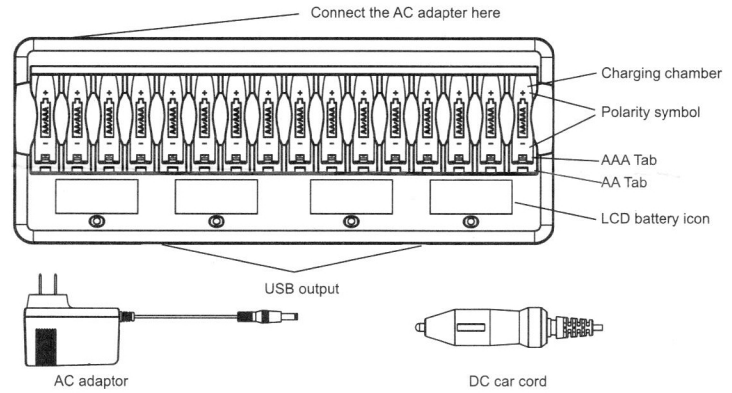
AC Adaptor Precautions

- Never use an electrical outlet whose voltage is outside the rating marked on the AC adapter. Doing so can cause fire or electrical shock. Use only the supplied AC adapter or DC car cord (optional) for the charger.
- Do not allow the AC adapter power cord to be cut or damaged. Do not place heavy objects on it. A damaged AC adapter cord may cause fire or electrical shock.
- Never try to modify the AC adapter power cord, or subject it to severe bending, twisting, or pulling. Doing so may cause fire or electrical shock.
- Never touch the AC adapter while your hands are wet. Doing so may cause electrical shock.
- Do not overload extension cords or wall outlets. Doing so may cause fire or electrical shock.
- Indoor use only, do not expose the charger to rain or snow.
- To reduce the risk of damage to the electrical plug and cord, disconnect by pulling the plug and not the cord.
- Make sure the cord is not placed in way of traffic so that it will not be stepped on, tripped over, or subject to damage.
- To reduce the risk of electric shock, unplug the charger from the outlet before cleaning or when not in use.
- Do not use solvents to clean the unit. It may damage the surface and the plastic parts of the unit. Clean the unit gently with a soft, dry cloth only.
- Not recommended for use by children.

Battery Handling Precautions

Incorrect use or handling of batteries can cause them to leak or burst and pose a danger of serious damage to your battery charger. Be sure to note the following important precautions to avoid problems:

- Use only Ni-MH dry cell batteries with the charger.
- Charge Ni-MH rechargeable batteries only. Do not charge any other kind of batteries as they may burst and cause personal injury and damage.
- Always make sure that the plus (+) and minus (-) ends of the batteries are facing the correct direction, as noted by the markings on the charger itself. Improper loading of batteries can cause personal injury or damage to nearby objects.
- Do not expose batteries to direct heat or dispose of them by burning. Doing so can cause an explosion.
- Do not operate the charger in an environment with temperatures over 40°C due to the risk of electrolyte leakage, over-heating, and battery damage.
- The batteries that power the equipment normally become warm as they discharge.
- If electrolyte enters the eyes, immediately wash eyes with cold running water and seek immediate medical attention.
- Please recycle batteries! Preserve our environment. Batteries are highly recyclable.



(A) Power Input (For indoor usage ONLY)

- Connect the supplied AC adapter's barrel plug into the charger's power input jack in the rear.
- Plug the AC adapter into a standard AC outlet, or for in-car usage:
 - Plug the optional DC car cord into your vehicle's 12V cigarette lighter without the charger plugged in.
 - Connect the charger to the connector-end of the DC car cord.

(B) Battery Charging

- Insert 1-16 AA or AAA batteries into the battery chambers as indicated by the polarity symbols (+ and -) marked inside each chamber.
- A flashing 'full battery' icon indicates abnormal batteries, such as bad batteries or alkaline batteries, and the charger will stop charging.
- When the batteries are fully charged, a 'full battery' icon lights.

(C) Battery Discharging & Refreshing

- Insert 1-16 AA or AAA batteries into the battery chambers as indicated by the polarity symbols (+ and -) marked inside each chamber.
- Press 'DISCHARGE' once to discharge AA/AAA batteries. The battery icon will shift up and down while discharging.
- When the batteries are fully discharged, the battery icon stops shifting and displays the battery capacity while charging.

When charging is completed, unplug the charger from the outlet and remove the batteries from the charger.

CHARGING TIME

Capacity	Type Ni-MH	1~16 cells
850 mAh	AAA	Approx. 4.7 hrs
1000 mAh	AAA	Approx. 5.6 hrs
2000 mAh	AA	Approx. 5 hrs
2500 mAh	AA	Approx. 6.3 hrs
2700 mAh	AA	Approx. 6.8 hrs

* Actual charging time may vary depending on the cell's discharge level, capacity, and condition. Using the charger in temperatures above 35°C may increase charge times.

DISCHARGING TIME

Capacity	Type Ni-MH	Current(mA)	Discharging time
			1~8 cells
850 mAh	AAA	200	Approx. 4.25 hrs
1000 mAh	AAA	200	Approx. 5 hrs
2000 mAh	AA	200	Approx. 10 hrs
2500 mAh	AA	200	Approx. 12.5 hrs
2700 mAh	AA	200	Approx. 13.5 hrs

**SAFETY TIMER SHUT OFF:
AA/AAA 6.5 Hrs**

Notes

Please replace the battery in the following situations:

- 'Full battery' icon flashes when a battery is inserted. This indicates the battery is old or defective.
- The LCD does not light up after a battery is inserted. This indicates the battery is no longer usable. A 'full battery' icon lights up when fully charged batteries are re-inserted into the charger. The batteries will not be re-charged. Do not use the charger with low-quality batteries as they may leak and cause damage.

SPECIFICATIONS

- POWER ADAPTER ----- Input 100-240V AC 47-63 Hz Output 12V 2A
- RAPID BATTERY CHARGER ----- Input 12V DC 2A
Output 1.5V AA = 400mA (per channel) /
AAA = 180mA (per channel)
- AUTOMATIC SHUT-OFF----- Negative Delta V
- SAFETY STANDARD ----- Adapter RoHS/FCC/UL/CUL/CE Charger CE/RoHS
- DIMENSIONS ----- 280 x 108 x 30 mm
- WEIGHT ----- 357g (Charger unit)

Specifications are typical; individual units may vary. Specifications are subject to change and improvement without notice. The actual product may vary from the product image in this document.