



## Mach 1® FUSION Universal Speed Charger™ For Virtually All 3.6 - 7.4 Volt Li-Ion Batteries, 3.6 & 6 Volt NiMH Batteries and AA/AAA Size NiMH Cells

PLEASE READ THE INFORMATION AND FOLLOW ALL INSTRUCTIONS THOROUGHLY BEFORE USING THIS PRODUCT.

### Introduction

The Mach 1 Fusion, Universal Speed Charger is the most technologically advanced and fully automatic battery charger available today. This unit is a "Fusion" of all of Lenmar's Mach 1 chargers, giving you one charger which is compatible with 3.6 / 3.7 & 7.2 / 7.4 Volt Lithium-Ion batteries, 3.6 and 6 Volt NiMH batteries and AA / AAA size NiMH cells for camcorders and digital cameras from Sony, Canon, JVC, Panasonic, Hitachi, RCA, Nikon, Kodak, Fuji and other manufacturers. Where you used to need 3 or more different chargers, the Fusion does it all. In addition to the adapter plates included, you can also purchase additional adapter plates for other Li-Ion, and NiMH battery models, guaranteeing that whatever your needs are, now and in the future, the Mach 1 Fusion is the only charger you will ever need.

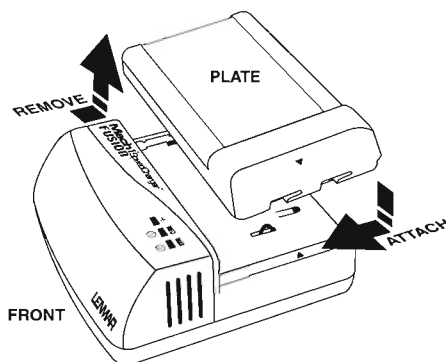
The Mach 1 Speed Charger features microprocessor controlled NeoTherm2™ active pulse speedcharging to charge your battery approximately three times faster than other chargers. Not only will it charge the battery safely and reliably, it will prolong battery life. Charging progress, MAX charge and error conditions are all provided by the three LED indicators.

Flexible power input allows you to use the Mach 1 Speed Charger from home or overseas with its 110V-240V AC Universal Power Supply, or on the road using the DC Cigarette Lighter Adapter included.

### Operation:

#### Getting Ready

Choose the adapter plate for the type of battery you will be charging. Each of the adapter plates is labeled as to the batteries it can work with. If the charger base does not already have the adapter plate you want attached, you will need to remove the adapter plate first by pushing down on the plate and sliding it to the rear of the charger base (away from the LED indicators). Then, attach the selected adapter plate to the charger unit by aligning the arrows on the sides of the adapter plates and the charger base as shown. While pressing down lightly on the adapter plate, slide the plate toward the front of the charger base until it locks.



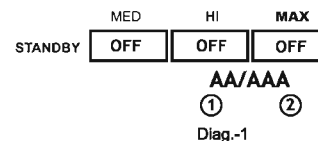
Plug-in, either the AC Adapter or the DC Cigarette Lighter power adapter, and connect the other end of the power adapter cable to the power input jack on the rear of the charger unit.

#### Status LED's

Together, the three LED's on the front of the Mach 1 charger will indicate the status of the battery and the charger. See the descriptions and diagrams included in the following sections regarding the various indications and their meaning.

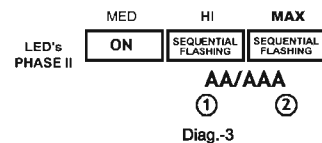
#### Charging Your Battery:

**StandBy Mode:** Without any battery installed, all of the indicator LED's will be off (see diag.-1).



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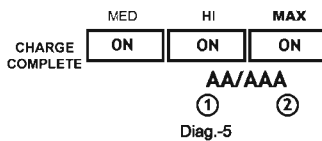
**Phase II – MED Charge:** The MED LED is on continuously and other LED's are flashing in sequence (see diag.-3). At this point the battery is typically about 50% charged. Some very small capacity batteries (650mAh) and worn out batteries can be as low as 10% charged.



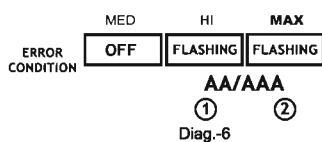
**Phase III – HI Charge:** The MED and HI LED's are on and the MAX LED is flashing (see diag.-4). At this point the battery is typically, about 70% charged.



**Charge Complete – MAX Charge:** All three LED's are on at the same time (see diag.-5). Charging has completed and the battery is fully charged. Once charge is complete, remove the battery pack as soon as it is practical.



**Error Condition – Charge Terminated:** If the Mach 1 Fusion detects a problem with a battery being charged, an "Error" indication will appear on the LED's, shown by the HI and MAX LED's flashing together while the MED LED is off (see diag.-6).



To reset the error condition, remove the battery and then unplug the charger from the power adapter for a few seconds, then reconnect it to the power adapter. If the Error occurs again, there may be a defect in the battery that will prevent safely charging.

Note: It is normal for the charger, AC adapter, or the battery to become warm during charging.

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#### Estimated Battery Charge Times:

##### AA/AAA NiMH Cells:

~1 Hour ±5% (based on 2000mAh AA and 800mAh AAA size cells)

##### NiMH Battery Packs:

| Battery Capacity | Time to Max. Charge |
|------------------|---------------------|
| 1200mAh          | 45 minutes          |
| 1800mAh          | 50 minutes          |
| 3800mAh          | 100 minutes         |

##### Li-Ion Battery packs:

| Battery Capacity | Time to Max. Charge |
|------------------|---------------------|
| 750mAh           | 30 minutes          |
| 1200mAh          | 40 minutes          |
| 2400mAh          | 75 minutes          |
| 5500mAh          | 185 minutes         |

\* Actual charge times may vary depending on the battery, cell capacity and condition.

#### Trouble Shooting Tips:

- Batteries should be replaced when runtime becomes short.
- If the battery is attached, and the status indicators are not lit, the charger unit may not be receiving power or the battery may not be making proper contact to the adapter plate. Recheck the connections and make sure that the AC socket or cigarette lighter has power. Unplug the unit and check that the battery is attached correctly. Also, make sure the adapter plate is the proper one and that it is securely attached to the charger base.
- Use a clean dry cloth when necessary to keep the metal contacts of both charger and battery clean.

#### Cautions:

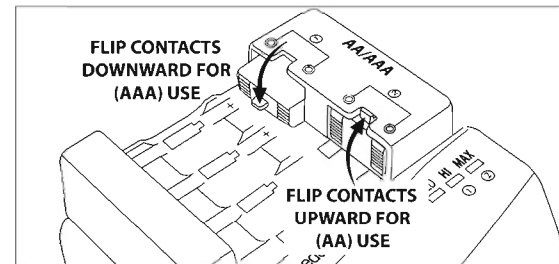
- For use with 3.6-3.7 & 7.2 – 7.4V Lithium-Ion (Li-Ion) batteries, 3.6 & 6V Nickel Metal-Hydrate (NiMH) batteries, and AA/AAA NiMH cells ONLY! Use with other type batteries voids warranty, may cause damage to the charger / battery and possibly cause injury to the user.
- Do not leave the battery connected to the charger for prolonged periods. Remove the battery after charge is complete.
- Never "store" the charger with any batteries or cells installed.
- Unplug the charger when not in use.
- Do not use, place or store the charger where it may come into contact with water or moisture.
- Always replace frayed or damaged wire and broken plugs immediately.
- Use this charger with the power adapters included in the package only.
- No user serviceable parts, opening chassis will void warranty.

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### Charging AA/AAA cells

After installing the AA/AAA adapter plate, insert either two or four AA or AAA NiMH cells (for AAA cells, rotate the contacts down as shown).



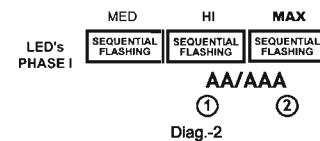
For two cells only, install both cells to be charged in position ① or position ② on the adapter plate. While the cells are being charged, the LED for position ① or position ② will glow red. Once charge is complete, the LED for that pair of cells will turn green. Remove the batteries as soon as it is practical.

Note: This adapter plate is for charging NiMH cells only. Do not attempt to charge any other type of cell on this plate.

### Charging Li-Ion and NiMH Battery Packs

Once a battery has been properly connected to the appropriate adapter plate, the charger will determine the status of the battery and begin the proper phase of the charging cycle. Depending on if the battery pack to be charged is NiMH or Li-Ion, either the center or right LED will glow Red for up to 30 seconds as the battery is analyzed, followed by the appropriate charging phase(s). There are 3 phases to the charge cycle. The battery may be removed during any of the charging phases without harm to the battery or charger unit.

**Phase I – Initial Charge:** All 3 LED's flashing Green in sequence from MED (left) to MAX (right) (see diag.-2). If the battery is low, this will be the first charge phase. With high capacity batteries, this phase can sometimes be the longest of the 3 phases. Similarly, with some low capacity batteries and batteries reaching the end of their life, this phase can be very short.



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### Specifications:

|                                |  |
|--------------------------------|--|
| <b>Compatibility</b>           | Virtually all 3.6-7.4V Li-Ion and 3.6/6V NiMH Battery Packs for Digital Cameras and Video Camcorders, plus 2/4 AA or AAA Size NiMH Cells   |
| <b>Charging Specifications</b> | <ul style="list-style-type: none"> <li>Charge Method: NeoTherm 2 - Adaptive Pulse Charge Algorithm (Patent Pending)</li> <li>No. of Channels: 2 Independent Charging Channels</li> <li>Charge Current: 1.85A ±20%, 2.2A Max</li> <li>Trickle Charge: (60mA) NiMH only</li> <li>Charge Term: -DV (NiMH only, 10mV/cell), Max. V, Max. T (AA/AAA cells only), Max. Time</li> </ul> |
| <b>Safety Mechanisms</b>       | <ul style="list-style-type: none"> <li>Mechanical and electronic protection from attempted charge with reverse polarity.</li> <li>Detection and Prevention of Charging of: <ul style="list-style-type: none"> <li>-NiCd or Alkaline Cells</li> <li>-Wrong Polarity</li> </ul> </li> </ul>  |
| <b>Indicators</b>              | Bi-Color LED's show status of the battery under charge or error condition  |
| <b>Power Supply</b>            | <ul style="list-style-type: none"> <li>Wall Type Switching AC Adapter</li> <li>Input - 100-240 VAC, 50-60 Hz (International)</li> <li>Output - 12VDC / 2.0A, Car Cigarette Lighter Adapter (12V)</li> </ul>  |
| <b>Operating Temperature</b>   | NiMH Batt. Packs & AA/AAA - 0°-30°C<br>Lithium Ion - 0-35°C  |
| <b>Safety Certifications</b>   | CE, UL, UL-C, FCC (AC Adaptor)   |

### Limited 3 Year Warranty

This limited warranty starts from the date of original purchase and expires 3 years thereafter. If, during this period, any part, because of manufacturing defects or workmanship fails to function properly under normal use will be repaired at no charge for parts and labor or, at our option, the product will be replaced. The following is excluded: damages from delay or loss of use of equipment, or damaged batteries, malfunctions resulting from misuse, tampering, unauthorized repairs, modifications, or accident.

Package the unit and its accessories carefully using ample padding material to prevent damage in transit and ship it prepaid and insured to:

Lenmar Enterprises, Inc.  
4035 Via Pascador  
Camarillo, CA 93012

When sending in product for service, your package should include evidence of date and place of purchase. Enclose \$10.00 for shipping and handling for addressees in the U.S. For outside the U.S. and Canada, freight will vary depending upon ship to address.

For additional questions, comments or to explore other Lenmar battery solutions, visit our web site at [www.lenmar.com](http://www.lenmar.com) or call us at 805/384-9600

The following statement is required in the state of California pursuant to the settlement of an action brought by the Mateel Environmental Justice Foundation against multiple electronics and appliance manufacturers.

**WARNING:** Handling the cord on this product will expose you to lead, a chemical known to the state of California to cause birth defects or other reproductive harm. **Wash hands after handling.**

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