INPUT POWER SOURCE VOLTAGE
As a general rule, the input power source voltage should be 1.5 volts DC above the peak-voltage of the battery pack being charged.
Example 1: (6 cell Ni-Cd pack peak-voltage=10.5 volts) + (1.5 volts) = 12 voltsDC
Example 2: (8 cell transmitter pack-peak-voltage=13.5 volts) + (1.5 volts) = 15 voltsDC
Remember that older battery packs peak at higher voltages.
If your power supply's output voltage does not adjust high enough to peak the battery pack as described above, 8 cell packs can be charged as two, 4 cell packs.

INPUT POWER SOURCE CONNECTION
The Millennium's input power connection can be found in the lower corner of the back panel of the case. The supplied power harness has a matching connector attached to it, and will plug directly to the panel-mounted connector on the back of the Millennium case.
When looking at the panel-mounted connector on the back of the case, the lower pin is negative (-), and upper pin is the positive (+) connection and is marked with a raised rib in the plastic connector shown below. A view of the Millennium's positive (+) input pin:

Acceptable Input Power Sources:
DC power supply or lead-acid battery

Input Power Source should meet/exceed desired charge rate.

Connect input power harness to lead-acid battery before connecting harness to Millennium.

Output current of power source should meet/exceed desired charge rate.

Acceptable Input Power Sources:
• DC power supply
• Lead-acid battery

Example 1:
(10.5 volts) + (1.5 volts) = 12 voltsDC
≈

Example 2:
(13.5 volts) + (1.5 volts) = 15 voltsDC
≈

VOLT THRESHOLD SETTING
From the Start screen, push the (•) button three times to go to the Volt Threshold option screen, or more times from the Volt Tone screen.
The Volt Threshold value entered is the drop in millivolts that the Millennium looks for to determine that the battery pack has peaked.
This is adjustable from 4 to 20 mV/cell (refer to Tips & Rec. Settings Section).
To adjust, push the ENTER button from the Volt Threshold option screen.
You can now use the down (•) and up (+) buttons to change the value.
DETAIL CHARGE HISTORY

From the Start screen, push the up (▲) button four times to go to the View Charge Info option screen, or once more from the Volt Threshold screen. Remember that these screens are on a loop, and you can go either direction to get back to a desired option screen.

The View Charge Info option gives you detailed information about the battery pack you are working on. This helpful comparison of battery packs, and also tracking the performance of your packs.

To view the charge history, push the ENTER button from the View Charge Info option screen. If the Millennium has never been used, or it has been reset to factory defaults, all values will be zero.

The display shows the battery’s peak voltage, the time in seconds to charge the pack, the battery pack’s capacity in milliamp hours, and the pack’s energy measurement in joules. The calculations used are:

- Capacity (mAh) = \( \frac{\text{Charge Current (milliamps)} \times \text{Charge Time (hours)}}{3600} \)
- Energy (J) = \( \text{Charge Current (amps)} \times \text{Charge Time (seconds)} \times \text{Average Charge Voltage} \)

CHARGE MODE SELECTION

From the Start screen, push the down (▼) button once, or the up (▲) button five times to go to the Charge Mode option screen.

Press the ENTER button from the Charge Mode option screen. You can now use the down (▼) and up (▲) buttons to change the Millennium’s method of charging. The choices are as follows:

<table>
<thead>
<tr>
<th>Charge Mode</th>
<th>NiCd Linear</th>
<th>NiCd Pulse Wave</th>
<th>NiMH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cells Current (A)</td>
<td>6 4.3</td>
<td>6 2.2</td>
<td>6 1.6</td>
</tr>
<tr>
<td>Cells Amps Pulse</td>
<td>4.3 4.3</td>
<td>4.3 4.3</td>
<td>4.3 4.3</td>
</tr>
<tr>
<td>Bms</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Trickle Charge Off</td>
<td>0.2A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Press ENTER when the desired charge method screen is visible. After entering into this charge parameter adjustment level of the software, the screen will indicate that you can change the value of the active parameter by underlining the value. Use the down (▼) and up (▲) buttons to select the parameter. Press ENTER to activate the selected parameter on the screen, and again use the down (▼) and up (▲) buttons to adjust.

In each charge mode (Linear, Reverse Pulse, and Ni-MH), you can adjust the number of cells in the battery pack (4-8), and the charge current (amps). The display shows the battery’s peak voltage, the time in seconds to charge the pack, the battery pack’s capacity in milliamp hours, and the pack’s energy measurement in joules. The calculations used are:

- Capacity (mAh) = \( \frac{\text{Charge Current (milliamps)} \times \text{Charge Time (hours)}}{3600} \)
- Energy (J) = \( \text{Charge Current (amps)} \times \text{Charge Time (seconds)} \times \text{Average Charge Voltage} \)

THE CHARGING PROCESS

After starting charge, the battery and connections are analyzed. If needed, the Millennium will attempt to condition the battery with a low-level trickle charge to bring up individual cell voltages so that successful charging can occur without reversing a cell. To stop charge, push BACK button.

During the charge, the LCD cycles through three screens of charge information, including: (Charge time & pack voltage), (charge mode & current, charge time, & pack voltage), and (charge mode, charge current, charge time, & pack voltage).

At the end of charge, the Millennium will cycle between the charge history screen and a Charge Complete screen accompanied by an audible alert.

RECOMMENDED SETTINGS (Ni-Cd & Ni-MH)

- Ni-Cd: Charge at 1.25 amps for Sub-C & D cells, and 0.5-1.0 amp for AA’s. Battery makers specify the charge current at no more than 2.5 times the capacity (2.5 \( \times \) 2000 mAh = 5,000 mAh) to avoid damage.
- Ni-MH: Charge Sub-C & Ni-MH cells at 4.0-5.5 amps and trickle charge OFF.

- Ni-Cd: Charge sub-C cells smaller than Sub-C size at 0.5-0.8 amp. Not recommended for Sub-C and larger cells.

- Ni-MH: Charge cells smaller than Sub-C size at 0.5-0.8 amp. Not recommended for Sub-C and larger cells.

- Reverse Pulse Charging Mode
  - Ni-Cd: A rev. pulse duration of 12ms will help enhance run times & increase average discharge voltage by lowering battery’s internal resistance. Use 5-mils for small (AA) cells & 10-mils for large (Sub-C & D) cells.

TROUBLE-SHOOTING GUIDE

This section lists the messages that may appear on the Millennium’s display, and the probable causes and solutions. If you are unable to solve the problem, check our website or call our Customer Service Department.

- • Battery voltage too low to begin charge process.
  • One or more cells shorted.
  • Number of cells set too high.
  • Output leads/alligator clips are shorted.

- Battery Not Connected
  • Battery pack connected backward.
  • Charging attempted with no battery connected.
  • Charging attempted with no source power.
  • Battery pack has open cell or bad connection—Check battery pack and cells.

- Battery Not Shorted
  • Input power source disconnected while charging.
  • Battery disconnected while charging.
  • Battery voltage close to source voltage—Increase input power source voltage.
  • Output leads un-shortened during conditioning.

- Charger Shutoff Due to Overheat
  • Internal temperature above 203°F—Check intake grill for blockage. Will go to Start screen when cool.

- Set Alarm Tone
  • No Alarm or Button tone is heard—Alarm or Button tone is set too low. Increase tone setting.

**To reset all factory defaults and settings, hold down the BACK button during the Millennium’s start-up screen until “Factory Settings Restored” is displayed.**

CUSTOMER SERVICE & REPAIRS

NOVAK ELECTRONICS, INC.
18910 Teller Avenue
Irvine, CA 92612
(949) 833-8873
FAX (949) 833-3031
www.teammovonovak.com

Mon-Thur: 8:00am-5:00pm (PST) • Fri: 8:00am-4:00pm (closed every other Fri.)

Before sending Millennium for service, review Trouble-Shooting Guide & instructions. Refer to enclosed CHARGER SERVICE CARD to the dealer and make sure it is included with the Millennium. Service cards can be obtained by downloading from our website or call our customer service.

- • Hobby dealers/distributors are not authorized to replace product thought to be defective.
- • If a hobby dealer returns your Millennium for service, submit a completed warranty form (verified by dated itemized sales receipt)

PRODUCT WARRANTY

Novak Electronics, Inc. guarantees the Millennium to be free from defects in materials and workmanship for a period of 120 days from original date of purchase. Warranty does not cover normal wear and tear. Warranty does not cover incorrect installation, components worn by use or excessive force, exceeding the recommended input voltage, damage resulting from improper charge or discharge, battery materials not compatible with the product, tampering with the internal electronics, allowing water, moisture, or any other foreign materials to enter charger or cells. Novak Electronics, Inc. reserves the right to modify the products stated in this warranty without notice.

- • Novak Electronics makes no electronic components (resitors, etc.) available for sale.
- • To provide the most efficient service possible to our customers, it is not our policy to contact customers by phone or mail.

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