TENERGY®

TB6B

Multifunction Balance Charger

Product Manual

TB6B Multifunction Balance Charger **Quick Start Guide**

Must read and follow the battery manufacturer's instructions before charging the battery. It's important to review the included Warning & Disclaimer sheet before using the Multifunctional Balance Charger. For full details on how to operate the TB6B charger, please refer to the Product Manual. The following quick start guide is intended to help cover the basics of how to charge a Nickel-metal hydride or Lithium polymer battery pack with the TB6B charger.

Video Guide available at:
bit.ly/tb6bvideoguide

OR scan the following QR code with the phone:

Need additional help? Email: service@tenergy.com

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How to Charge a NiMH Battery Pack

1) Connect everything together:
   a. Connect the power supply cord into the AC outlet and DC connector into the DC port on the left side of the TB6B charger.
   b. Connect the multi-charging harness to the right side of the charger matching the red prong to the positive (+) slot and black prong to the negative (–) slot.
   c. Connect the battery pack to the matching connection (Tamiya, mini Tamiya, JST, HiTec, EC3, Deans, XT60) on the multi-charging harness.

2) Press the "Mode/ESC" until you see "NiMH BATT".

3) Press "Enter/Start" button to see "NiMH CHARGE", and then press "Enter/Start" button again.

4) Change the current to the desired Amp with the "Dec." and "Inc." buttons. Refer to your battery pack's instruction for ideal charging current.

5) Verify that the desired charging current is accurate, to begin the charging process press down and hold the "Enter/Start" button to start the charging process.

6) Do not leave the charger and battery unattend during the charging process. Once the charging process is complete the TB6B will beep once to alert you that the process is done.

How to Balance Charge a LiPO/Li-ion Battery Pack

Please be sure to read the included Warning & Disclaimer sheet before using the TB6B charger for LiPO battery packs and take the necessary precautions. Always charge LiPo or Li-ion battery packs using balance charging mode only, and ensure the included JST-XH balance board is properly connected between the charger and the battery. This charger is specifically designed for charging LiPo/Li-ion battery packs equipped with a balance connector via balance mode. Failure to comply may result in fire or serious injury.

1) Connect everything together:
   - Connect the power supply cord into the AC outlet and DC connector to the DC port on the left side of the TB6B charger.
   - Connect the included JST-XH balance board to the TB6B's balance port.
   - Connect the battery's JST-XH balance connector to the corresponding slot on the JST-XH balance board that matches the battery's series configuration 2S(3pins), 3S(4pins), 4S(5pins), 5S(6pins), or 6S(7pins). JST-XH balance connector is the only connector type that TB6B balance port uses.
   - Connect the battery pack's power connector (Tamiya, mini Tamiya, JST, HiTec, EC3, Deans, XT60) to the matching connection on the multi-charging harness.

2) Press the "Mode/ESC" until you see "LiPO BATT", then press the "Enter/Start".

3) Press the "Inc." button to choose "LiPO BALANCE". Press "Enter/Start".

4) Change the Amp to our desired charging speed with the "Dec." and "Inc." buttons. Then press "Enter/Start".

5) Now change the Voltage to match your LiPO battery pack's configuration. Press and hold to begin the charging process.

6) Verify the R: and S: values match and then press "Enter/Start" to begin the charging process.
   - If they do not match, then the voltage information you provided is likely incorrect, press "Mode/Esc" to go back to the previous screen to change the voltage.
   - If you encounter a Battery Vol ERR, double check your battery pack's LiPO balance connector is connected with the balance board, and the balance board is securely connected to the Balance socket on the charger.
   - If you encounter a Connection Break error, it is possible your battery pack is wired incorrectly, please double check that the red wire on the battery pack is matching with the red wire on the connection on the harness. If they are aligned, double check that the connection is secure and try again.

7) Do not leave the charger and battery unattended during the charging process. Once the charging process is complete the TB6B will beep once to alert you that the process is done.

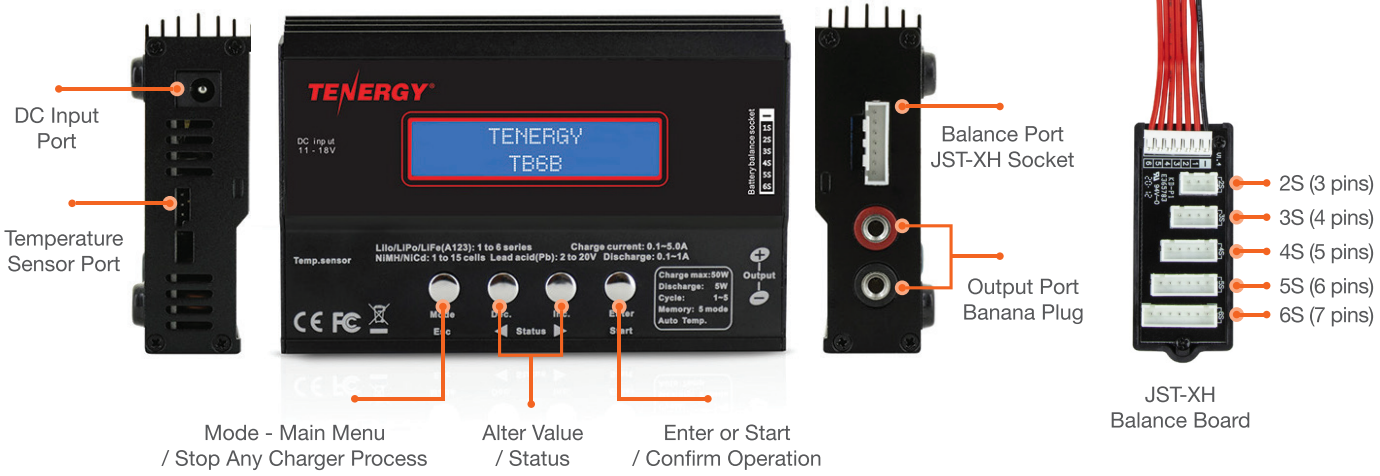
Table of Content

Specifications

Input Voltage Range	DC 10.5 – 18.0V
Display	Blue Backlight LCD
Controls	Four Buttons
Charge Current Range	0.1 – 5.0A
Discharge Current Range	0.1 – 1.0A
Charge Power Limited	Max. 50W
Discharge Power Limited	Max. 5W
Balance Current	Max. 250mA
Balance Tolerance	±0.01V
Battery Types/Cells	LiPo/Li-ion/LiFe: 1-6 cells NiMH/NiCd: 1-15 cells Pb (Lead Acid): 2-20V, 1-10 cells
Weight	260g
Dimension	130 x 85 x 26 mm

Introduction

Thank you for purchasing the TB6B Balance Charger. This product is a rapid charger with a high performance microprocessor and operating software. Please be sure to read this entire operating manual completely before you use this product for the first time, as it covers a wide range of information on operation and safety. It can be dangerous when batteries or chargers are mishandled. There are always risks of batteries catching fire and exploding when they are subjected to improper charging.



Key Features

Individual Voltage Balancer for Li-ion/Li-Polymer Batteries

TB6B has an individual-cell-voltage balancer inside, so it does not need a separate balancer when charging Li-ion/Li-Polymer batteries (Li-ion/LiPo/LiFe) connected to charger via JST-XH balancing connector.

Balance Individual Cells on Discharge

TB6B can also monitor and balance individual cells of the battery pack during the discharge process. If the voltage of any one cell varies abnormally, the process will be stopped and an error message will appear.

Accepts Various Battery Types

TB6B can accept these types of batteries - Li-ion, LiPo, LiFe, NiCd, NiMH, and Pb. Please select the correct one before starting the process.

Battery ‘Fast’ and ‘Storage’ mode

Li-Ion/Li-Polymer batteries can be charged for special purposes. ‘Fast’ charge reduces the charging time of the battery and ‘Storage’ mode controls the final voltage of the battery, suitable for long term storage.

Data Store/Load

The charger can store data for up to 5 batteries. Once set, you can automatically start the process without having to set it up every time.

Cyclic Charging/Discharging

Continually perform 1 to 5 cycles of charge ⟵⟶ discharge for battery refreshing and balancing.

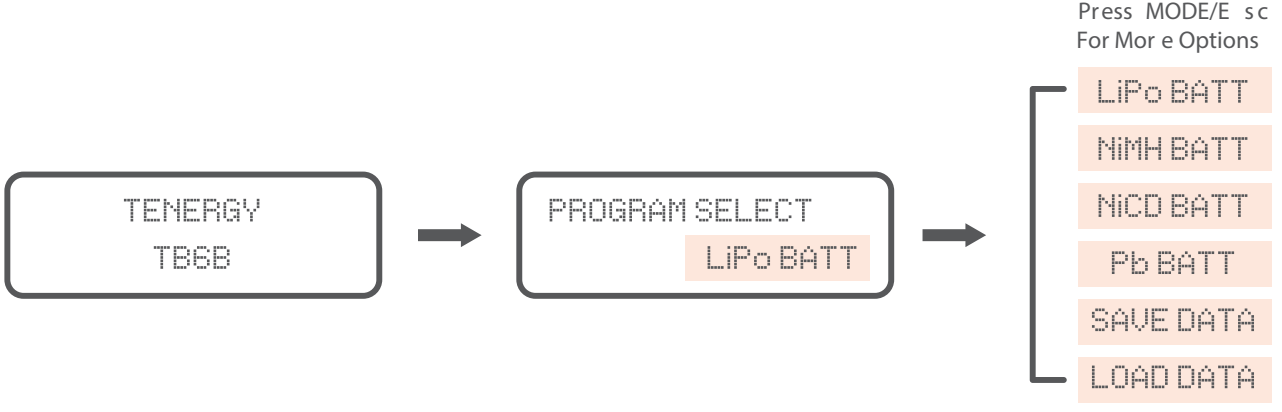
Robust Outer Aluminum Case

High-quality aluminum case is durable and very efficient at cooling down any internal heat.

Operating Instructions

Main Menu

When charger TB6B first powers up, the LCD screen will display the name of the charger for 2 seconds.
To select the desired program, press the “Mode/Esc” button, and cycle through the options.



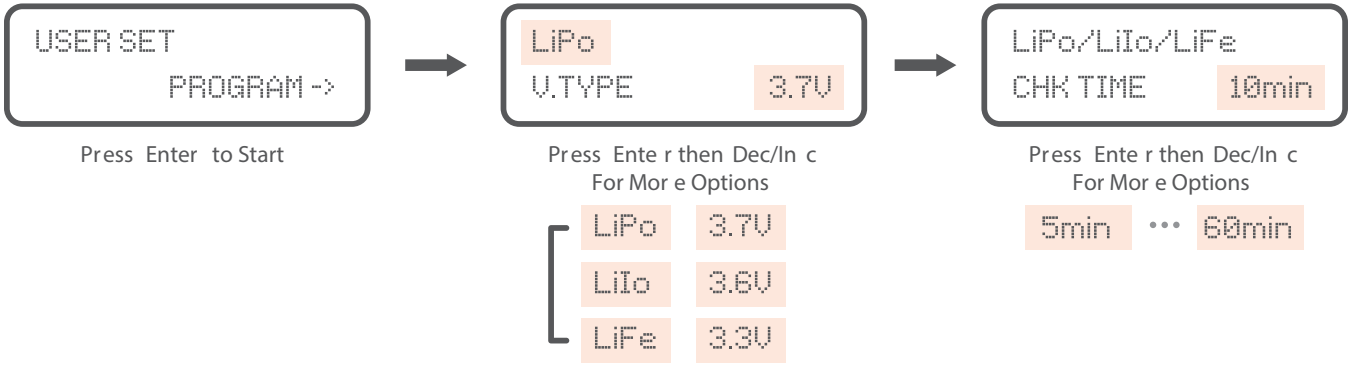
Initial Parameter Setup

Once the desired program is selected, hit the “Enter/Start” button to enter the submenu.
Once in the submenu, you can then hit “Enter/Start” to make the parameter numbers blink, and cycle through the options using the left (Dec.) and right (Inc.) “Status” keys.

Please be sure to select the correct battery chemistry and battery voltage (refer to Table A on Page 11). Misuse may lead to a fire or explosion

LiPo/Li-ion/LiFe Check Time

Normally, the charger can determine the cell count of the battery at the beginning of the charge/discharge process. However, when the battery is significantly discharged, the device may not correctly determine the cell count. When this happens, set the “check time” to 10 minutes, which should be enough for the device to then correctly determine the cell count.

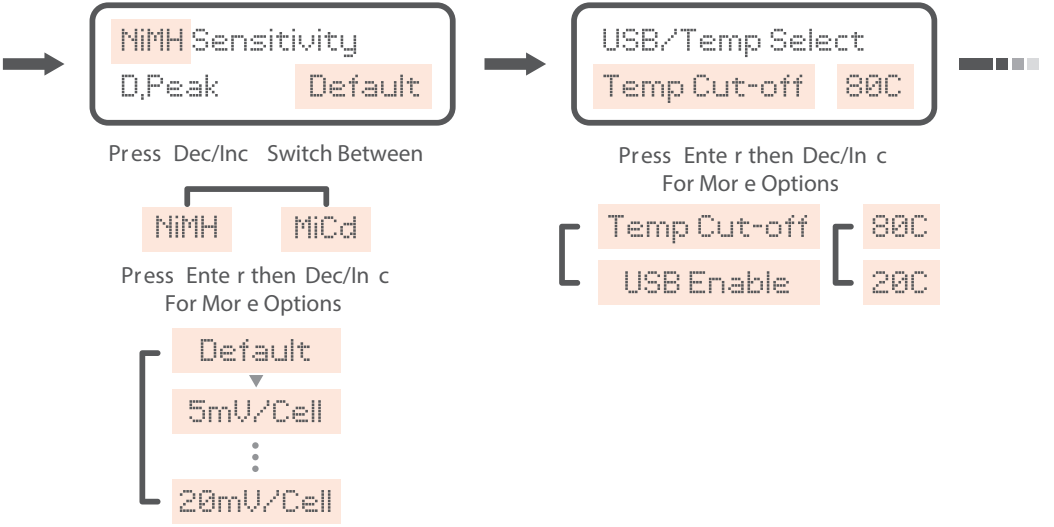


NiMH/NiCd Sensitivity

Delta Peak shows the trigger voltage for automatic charge termination of NiMH and NiCd batteries. D. Peak default setting is 12mV for NiCd and 7mV for NiMH. Please refer to the battery's technical specifications for the ideal value.

USB/Temp Select

For the optional thermometer attachment, this setting lets you change the temperature cut off.

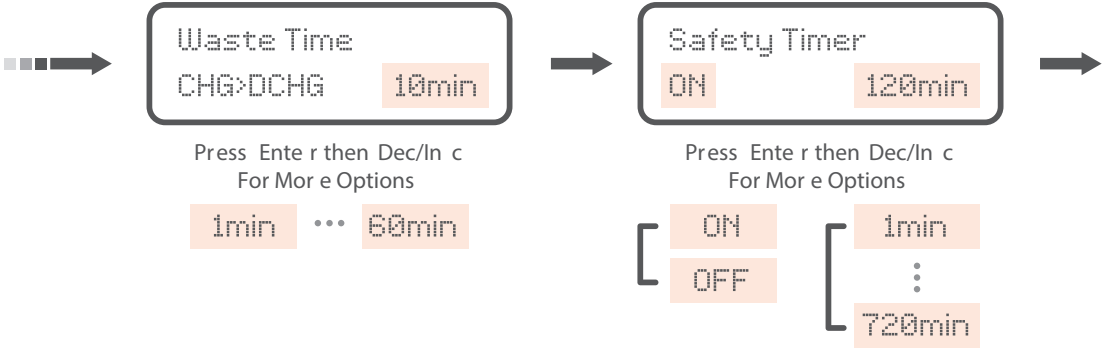


Waste Time

The cooling period between cycle charging and discharging.
Set more than 10 minutes to allow your battery time to cool-down between cycles.

Safety Timer

The back up alarm to ensure you don't overcharge your batteries.
You can turn this feature off or extend the timer.



Capacity Cut-Off

An additional safety feature to prevent overcharging.
Set the max amount the charger can charge before shutting down.

Key Beep & Buzzer

Key Beep - Enable or Disable sound when pressing the buttons.
Buzzer - Enable or Disable alarm.

Input Power Low

The charger stops charging if the input voltage goes below this value.

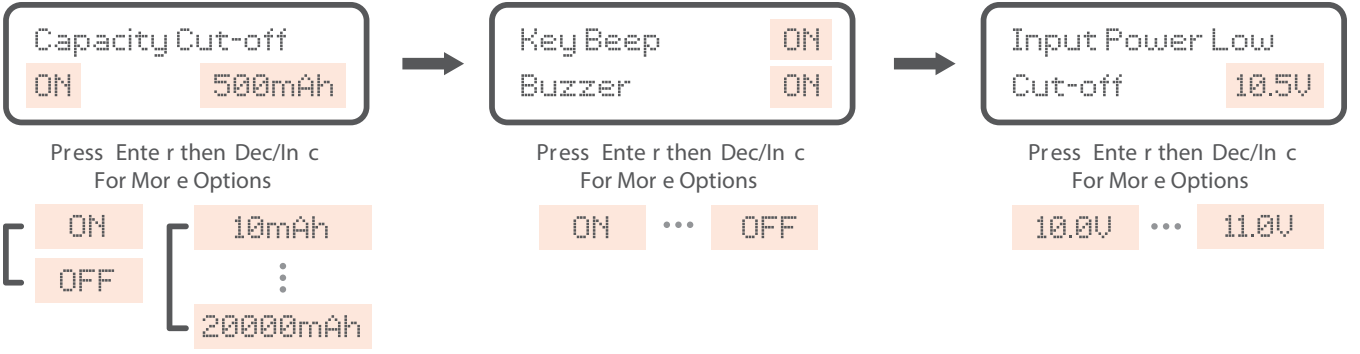
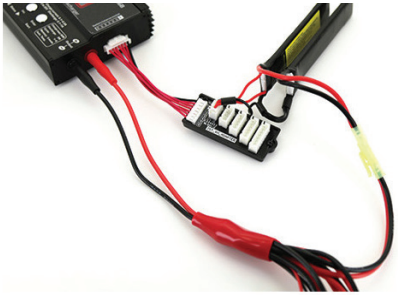


Table A

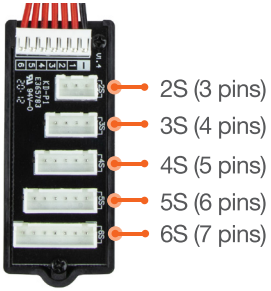
Battery T ypes	Li-Po	Li-Io	Li-Fe	NiMH	NiCd	Pd
Standa rd Voltage (V/cell)	3.70	3.60	3.30	1.20	1.20	2.00
Max. Char ge Voltage (V/cell)	4.20	4.10	3.60	1.60	1.60	2.45
Maximum Char ge Curr ent	1C	1C	1C	1C	1C	0.2C
Min. Dischar ge Voltage (V/cell)	3.00	3.00	2.00	1.00	0.85	1.75

How to connect the wires

Auto charging mode



Balance charging / storage / discharge mode



JST-XH Balance Board

Always charge LiPo or Li-ion battery packs using balance charging mode only, and ensure the included JST-XH balance board is properly connected between the charger and the battery. This charger is specifically designed for charging LiPo/Li-ion battery packs equipped with a balance connector via balance mode. Failure to comply may result in fire or serious injury.

Lithium Batteries (Li-Ion/LiPo/LiFe)

Please follow the main instructions to select the correct type of battery and parameter value for your desired application.

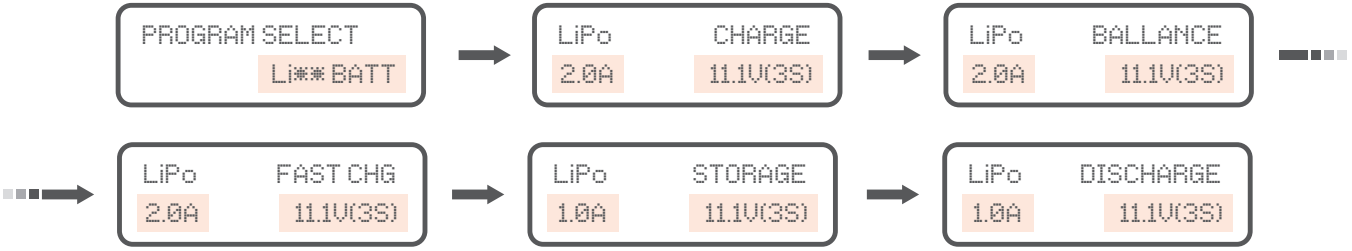
CHARGE – This is for individual batteries and some special battery packs that do not have a balance port or cell count. The left side of the screen shows you the battery and the current you selected. The right side shows the mode and the cell count of the battery selected.

BALANCE – This is for 2-6 cell Lithium batteries with a balance port. The battery's individual cell balance connector should be inserted into the balance board connected to the right side of the charger.

FAST CHARGE – This is for rapid charging of your batteries. The final charge capacity will be slightly reduced, but the charging time will also be shortened.

STORAGE – This is for charging/discharging a battery which will not be used for some time. This will keep the battery at 40% of its normal capacity so as not to waste a full charge over time.

DISCHARGE – Although Lithium batteries do not need to be discharged, this function allows for a discharge of over 90%.

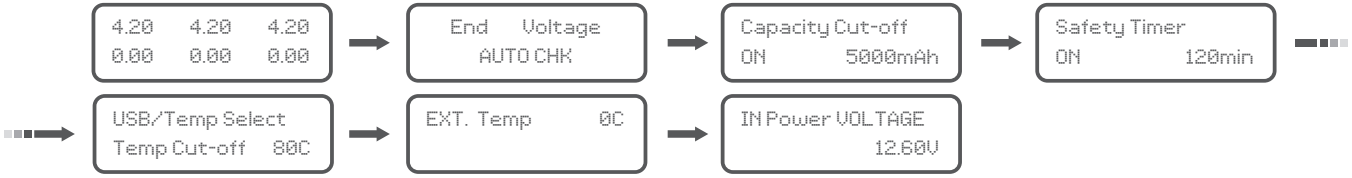


Selecting the Correct Cell Count

Once the type of battery and cell count is selected, press and hold the "**Enter/Start**" button for **2 sec**. This will take you to a screen to double check the cell count. "**R**" shows the number or cells found by the charger and "**S**" shows the number of cells the user selected. If they match, please continue by pressing the "**Enter**" button.
If not, press "**Mode**" return to the previous screen, double check the battery's specifications, and repeat the step.

Checking the Individual Voltage and Capacity

You will need to connect the balance plug. By using the "**Status**" buttons, you can check the safety capacity cut-off, safety timer, safety temperature, and the present voltage. You can also check the individual voltages of each battery while it is charging.



NiMH/NiCd Battery Program

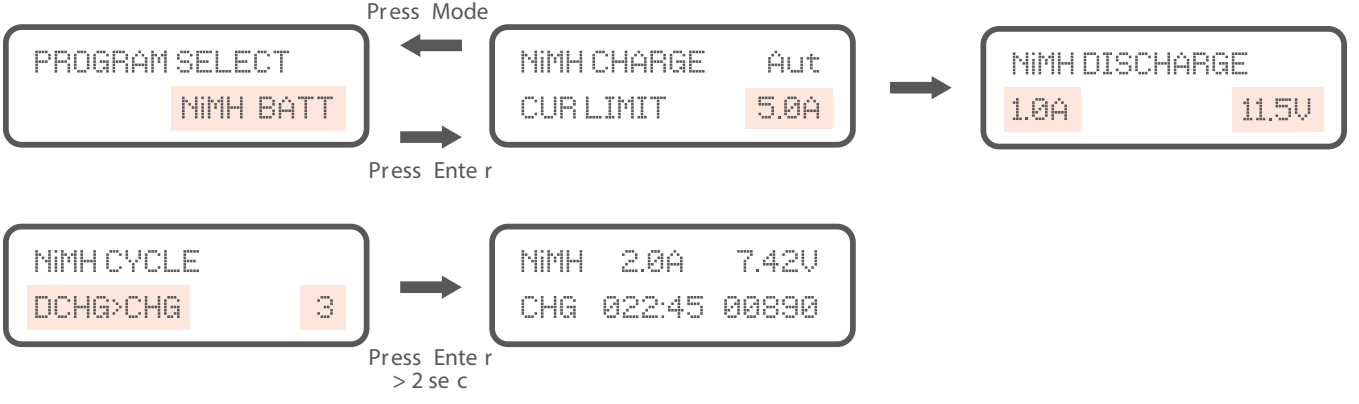
Just as in the main screen, use the "**Mode**" and "**Status**" buttons to cycle through the options.

Charge mode – The default is "AUT" In this mode, the user needs to select the upper limit of the charge current to avoid issues. In "MAN" mode, the device will charge the battery at the current you previously set. To switch between AUT and MAN mode, press the ◀(left arrow) and ▶(right arrow) buttons on the charger simultaneously at the NiMH Charge Current setting screen.

Discharge mode – The recommended voltage of NiMH batteries is 1.0V/cell and NiCd is 0.85V/cell. Otherwise, please refer to the manufacturer's recommendation for your battery.

Cycle mode – This mode will perform 1-5 cycles of Discharging/Charging the battery. Please use this mode for new NI batteries or long-term placement NI batteries. Only use this option if you are sure your battery needs it.

Once all of the steps above have been completed and verified, please press and hold "**EnterStart**" to begin the process.



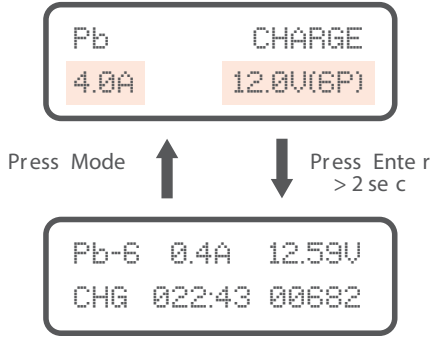
Pb Battery Program

Use this program for Pb batteries with voltages between 2 and 20V.
Please do not use rapid charging for Pb batteries.

Charging a Pb Battery

The left side of the screen will show the Amp of the battery, while the right side will show the voltage of the battery. After verifying that the voltage on the screen matches the voltage required by your batteries manufacturer, press and hold the “**Enter**” button for 2 seconds, and the process will start.

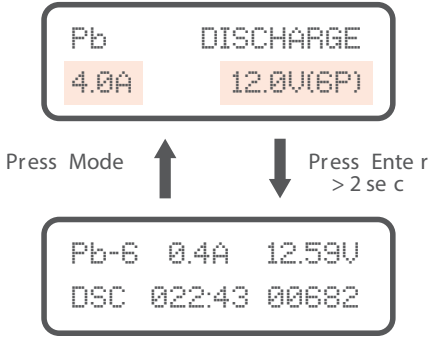
The charge can be stopped at any time by pressing the “**Mode/Esc**” button once.



Discharging a Pb Battery

Set the discharge current on the left side of the screen and final voltage desired on the right side. Then press and hold “**Enter**” to begin the process.

The charge can be stopped at any time by pressing the “**Mode/Esc**” button once.



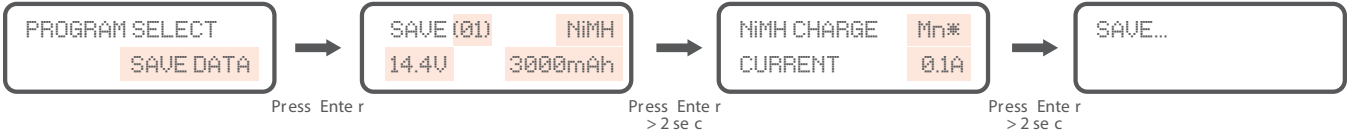
Save and Load Data Program

The charger can store data for up to 5 batteries.
Once set, you can automatically start the process without having to set it up every time.

Save Data

Press the “**Mode**” button until Save Data is selected on the screen, then press “**Enter**” to enter into the sub-menu. The blinking number shows you which data slot the saved profile will be in. This can be changed by pressing the left and right arrows, and selecting it by pressing “**Enter**” again.

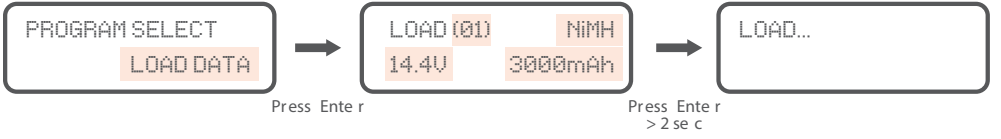
Continue by selecting the type of battery, voltage, capacity, etc. and set the data by pressing the “**Enter**” button each time. Once completed, press and hold the “**Enter**” button to save the data.



Load Data

Using the same process as the main menu, select the Load Data screen from the main menu. Then use the left and right arrow buttons to select the data you want to load.

Once selected, press and hold the “**Enter**” button for 2sec.



Warning and Error Messages

REVERSE POLARITY	The output cable is connected to a battery with incorrect polarity.
CONNECTION BREAK	Displayed when detecting an interruption in the connection between the battery and the output, or when voluntarily disconnecting the charge lead during operation.
SHORT ERR	A short-circuit occurred, please check the charging leads.
INPUT VOL ERR	The input voltage dropped below the limit.
VOL SELECT ERR	The voltage of the battery pack was selected incorrectly. Please verify and restart the process.
BREAK DOWN	A malfunction of the charger circuit has occurred.
BATTERY CHECK LOW VOLTAGE	The device detects a lower voltage than which was set. Please verify the cell count and restart the process.
BATTERY CHECK HIGH VOLTAGE	The device detects a high voltage then was set. Please verify the cell count and restart the process.
BATTERY VOLTAGE CELL LOW VOL	The voltage of one of the cells in the battery pack is too low. Please verify and restart the process.
BATTERY VOLTAGE CELL HIGH VOL	The voltage of one of the cells in the battery pack is too high. Please verify and restart the process.
BATTERY VOL ERR CELL CONNECT	There is a bad connection. Please check the connector cables.
TEMP OVER ERR	The internal temperature is too high. Please allow it some time to cool down.
CONTROL FAILURE	The unit needs to be repaired.

⚠ WARNING

Failure to follow these WARNINGS may result in fire or personal/property damages.

- When the charger is running, please keep the device uncovered and in a well-ventilated area so it does not get too warm. This is especially true if you're discharging a battery.
- Do not store or use in an environment colder than 41°F (5°C) or hotter than 122°F (50°C).
- Do not store or use in a wet or corrosive environment.
- Keep all flammable and volatile materials away from the device.
- Take care of the charger by not letting it fall or get shaken.
- Do not attempt to use voltage higher than recommended by the battery manufacturer.
- Ensure that the type and voltage of the battery is properly selected. Do not charge different batteries at the same time.
- This device is made for charging one battery pack. Please purchase separate accessories for multiple battery packs.
- Do not attempt to use this device on a non-rechargeable or damaged battery.
- Keep the charger away from pets and children at all times. Never leave this device unsupervised when connected to a power supply.

Warranty

This Tenergy product is warranted to the original purchaser to be free from defects in materials and workmanship under normal consumer use for a period of one (1) year from the original purchase date or thirty (30) days after replacement, whichever occurs later. The warranty provider's responsibility with respect to this limited warranty shall be limited solely to repair or replacement, at the provider's discretion, of any product that fails during normal use of this product in its intended manner and in its intended environment. This warranty does not cover damage or defect caused by misuse, neglect, accident, alteration, abuse, improper installation or maintenance.

To obtain warranty coverage, contact the Tenergy Customer Service Department at service@tenergy.com.