

POWERTECH PLUS



**AC/DC Dual Power Professional
Balance Charger/Discharger
MB-3633
User Manual**

INTRODUCTION

This unit is simple to use, but the operation of a sophisticated automatic charger does require some knowledge on the part of the user. These operating instructions are designed to ensure that you quickly become familiar with its functions. It is therefore important that you read right through the Operating Instructions, Warning and Safety Notes before you attempt to use your new charger for the first time.

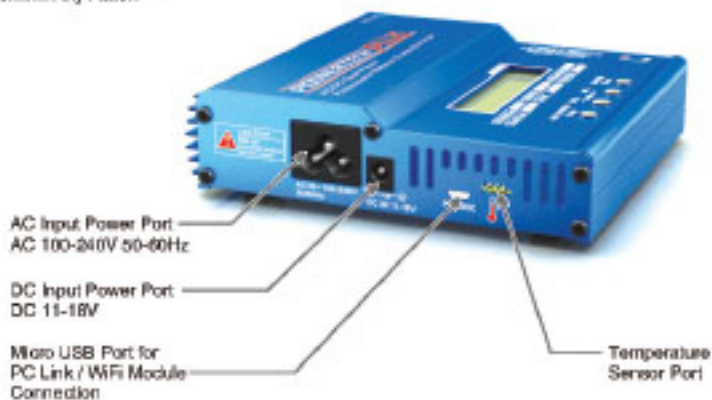
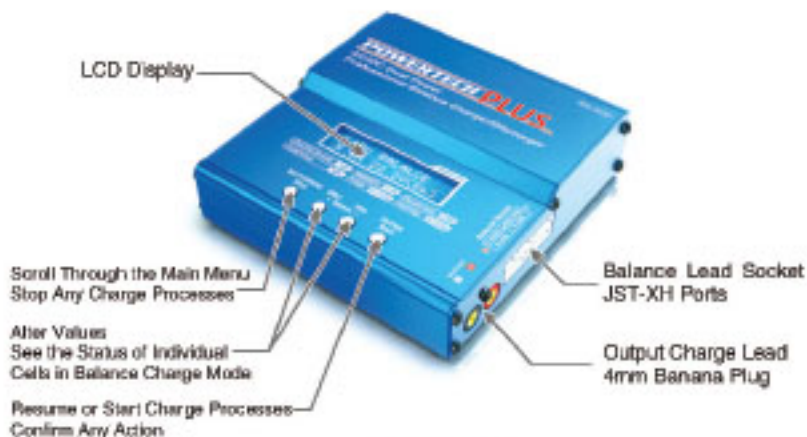
Users could set the terminal voltage by themselves and connect it to a PC for PC control and firmware upgrade. What's more, users could also use it as Lithium Battery Meter and Battery Internal Resistance Meter. There are Automatic Charging Current Limit, Capacity Limit, Temperature Threshold and Processing Time Limit which makes the charger safer.

The unit is a high-performance, micro processor control charge/discharge station with battery management suitable for use with all current battery types, with integral equalizer for six-cell Lithium-Polymer (LiPo), Lithium iron phosphate (LiFe) and Lithium-Ion (Lion) batteries; maximum 6A charge current and maximum 50W charge power. It can be powered by 11-18V DC source or from 100V-240V via the built-in switch-mode power supply.

Please **BE SURE** to read these **INSTRUCTIONS, WARNINGS** and **SAFETY NOTES** before you use the charger for the first time.

It can be dangerous to mis-handle batteries and battery chargers, as there is always a risk of batteries catching fire and exploding.

Please read this entire operating manual completely and attentively before using this product, as it covers a wide range of information on operating and safety. Or please do use this product in company with a specialist!



SPECIAL FEATURES

Optimized Operating Software

The unit features the so-called AUTO function that sets the feeding current during the process of charging or discharging. Especially for lithium batteries, it can prevent the overcharging which may lead to an explosion due to the user's fault. It can disconnect the circuit automatically and alarm once detecting any malfunction. All the programs of this product were controlled through two-way linkage and communication, to achieve the maximum safety and minimise trouble. All the settings can be configured by users!

Battery Memory (Data Store/Load)

The charger can store up to 10 different charge/discharge profiles for your convenience. You can keep the data pertaining to program setting of the battery of continuous charging or discharging. Users can call out these data at any time without any special program setting.

Terminal Voltage Control (TVC)

The charger allows user to change the end voltage. (For experts only).

PC Control Software "Charge Master"

The free "Charge Master" software gives you unparalleled ability to operate the charger through the computer. You can monitor pack voltage, cell voltage and other data during the charging, view charge data in real-time graphs. And you can initiate, control charging and update firmware from "Charge Master".

Internal Independent Lithium Battery Balancer

The unit employs an individual-cell-voltage balancer. It isn't necessary to connect an external balancer for balance charging.

Balancing Individual Cells Battery Discharging

During the process of discharging, the unit can monitor and balance each cell of the battery individually. An error message will be indicated and the process will be ended automatically if the voltage of any single one cell is abnormal.

Adaptable to Various Type of Lithium Battery

The unit is adaptable to various types of lithium batteries, such as LiPo, Lilon and the new LiFe series of batteries.

Fast and Storage Mode of Lithium Battery

Purposes to charge lithium battery varies, 'fast' charge reduce the duration of charging, whereas 'store' state can control the final voltage of your battery, so as to store for a long time and protect useful time of the battery.

Re-peak Mode of NIMH/NiCd Battery

In re-peak charge mode, the charger can peak charge the battery once, twice or three times in a row automatically. This is good for making certain the battery is fully charged.

Delta-peak Sensitivity for NIMH/NiCd

Delta-peak sensitivity for NIMH/NiCd battery: The automatic charge termination program based on the principle of the Delta-peak voltage detection. When the battery's voltage exceeds the threshold, the process will be terminated automatically.

Cyclic Charging/Discharging

1 to 5 cyclic and continuous process of charge ? discharge or discharge ? charge is operable for battery refreshing and balancing to stimulate the battery's activity.

Automatic Charging Current Limit

You can set up the upper limit of the charging current when charging your NiMH or NiCd battery, it is useful for the NiMH battery of low impedance and capacity in the 'AUTO' charging mode.

LiPo Battery Meter

The user can check battery's total voltage, the highest voltage, the lowest voltage and each cell's voltage.

Battery Internal Resistance Meter

The user can check battery's total internal resistance and each cell's internal resistance.

Capacity Limit

The charging capacity is always calculated as the charging current multiplied by time. If the charging capacity exceeds the limit, the process will be terminated automatically when you set the maximum value.

Temperature Threshold*

The battery's internal chemical reaction will cause the temperature of the battery to rise. If the temperature limit is reached, the process will be terminated.

** This function is available by connecting optional temperature probe, which is not included in the package.*

Processing Time Limit

You can also limit the maximum process time to avoid any possible defect.

WARNING & SAFETY NOTES

These warnings and safety notes are particularly important. Please follow the instructions for maximum safety; otherwise the charger and the battery can be damaged or at worst it can cause a fire.

- Never leave the charger unattended when it is connected to its power supply. If any malfunction is found, TERMINATE THE PROCESS AT ONCE and refer to the operation manual.
- Keep the charger well away from dust, damp, rain, heat, direct sunshine and vibration. Never drop it.
- The allowable DC input voltage is 11~18VDC
- The allowable AC input voltage is 100~240VAC
- This charger and the battery should be put on a heat-resistant, non-inflammable and non-conductive surface. Never place them on a car seat, carpet or similar. Keep all the inflammable volatile materials away from operating area.
- Make sure you know the specifications of the battery to be charged or discharged to ensure it meets the requirements of this charger. If the program is set up incorrectly, the battery and charger may be damaged. It can cause fire or explosion due to overcharging.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

Standard Battery Parameters

	LiPo	LiIon	LiFe	LiHV	NiCd	NiMH	Pb
Nominal Voltage	3.7V/ cell	3.6V/ cell	3.3V/ cell	3.7V/cell	1.2V/ cell	1.2V/ cell	2.0V/ cell
Max Charge Voltage	4.2V/ cell	4.1V/ cell	3.6V/ cell	4.35V/ cell	1.5V/ cell	1.5V/ cell	2.46V/ cell
Storage Voltage	3.8V/ cell	3.7V/ cell	3.3V/ cell	3.85V/ cell	n/a	n/a	n/a
Allowable Fast Charge	≤ 1C	≤ 1C	≤ 4C	≤ 1C	1C-2C	1C-2C	≤ 0.4C
Min. Discharge Voltage	3.03- 3.3V/ cell	2.9- 3.2V/ cell	2.6- 2.9V/ cell	3.1-3.4V/ cell	0.1- 1.1V/ cell	0.1- 1.1V/ cell	1.8V/ cell

Be very careful to choose the correct voltage for different types of battery otherwise you may cause damage to the batteries. Incorrect settings could cause the cells to fire or explode.

Never attempt to charge or discharge the following types of batteries:

- A battery pack which consists of different types of cells (including different manufacturers).
- A battery that is already fully charged or just slightly discharged.
- Non-rechargeable batteries (Explosion hazard).
- Batteries that require a different charge technique from NiCd, NiMH, LiPo or Gel cell (Pb, Lead acid).
- A faulty or damaged battery.
- A battery fitted with an integral charge circuit or a protection circuit.

- Batteries installed in a device or which are electrically linked to other components.
- Batteries that are not expressly stated by the manufacturer to be suitable for the currents the charger delivers during the charge process.

Please bear in mind the following points before commencing charging:

- Did you select the appropriate program suitable for the type of battery you are charging?
- Did you set up adequate current for charging or discharging?
- Have you checked the battery voltage? Lithium battery packs can be wired in parallel and in series, i.e. a 2 cell pack can be 3.7V (in parallel) or 7.4V (in series).
- Have you checked that all connections are firm and secure?
- Make sure there are no intermittent contacts at any point in the circuit.

Charging:

- During charge process, a specific quantity of electrical energy is fed into the battery. The charge quantity is calculated by multiplying charge current by charge time. The maximum permissible charge current varies depending on the battery type or its performance, and can be found in the information by the battery manufacturer. Only batteries that are expressly stated to be capable of quick-charge are allowed to be charged at rates higher than the standard charge current.
- Connect the battery to the terminal of the charger: red is positive and black is negative. Due to the difference between resistance of cable and connector, the charger can not detect resistance of the battery pack, the essential requirement for the charger to work properly is that the charge lead should be of

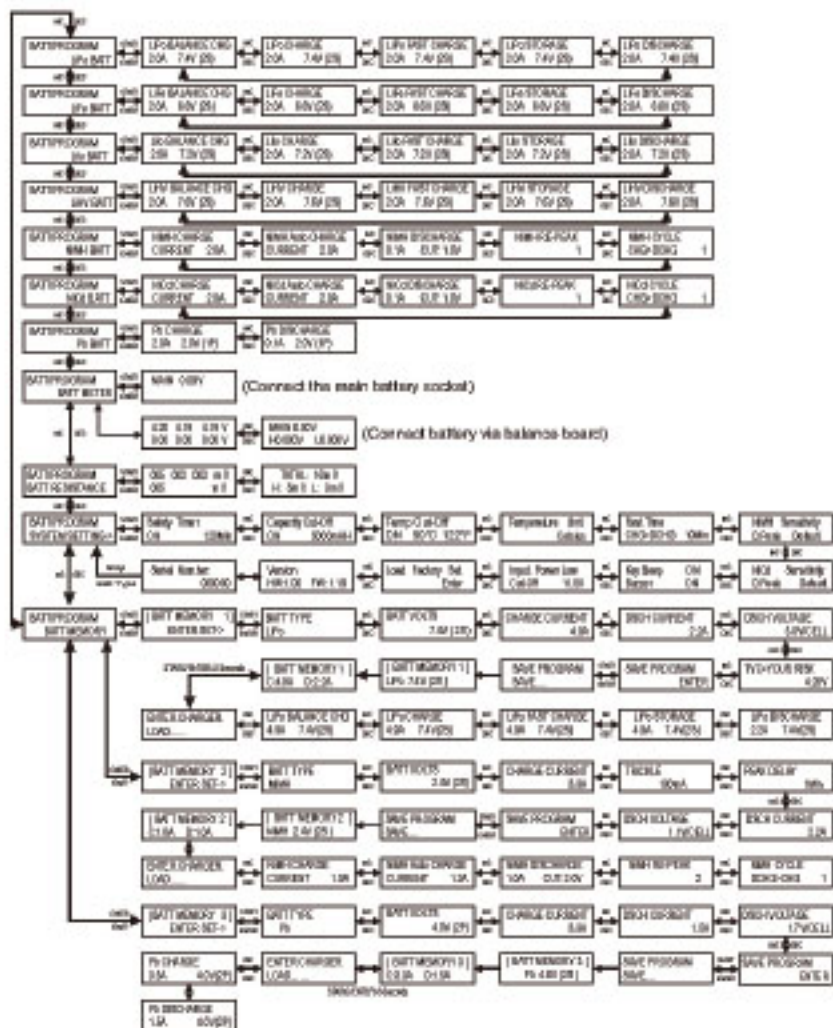
adequate conductor cross-section, and high quality connectors which are normally gold-plated should be fitted to both ends.

- Always refer to the manual by battery manufacturer about charging methods, recommended charging current and charging time. Especially, the lithium battery should be charged according to the charging instruction provided by the manufacturer strictly.
- Attention should be paid to the connection of lithium battery especially.
- Do not attempt to disassemble the battery pack arbitrarily.
- Please get highlighted that lithium battery packs can be wired in parallel and in series. In the parallel connection, the battery's capacity is calculated by multiplying single battery capacity by the number of cells with total voltage stay the same. The voltages imbalance may cause fire or explosion. Lithium battery is recommended to charge in series.

Discharging:

- The main purpose of discharging is to clean residual capacity of the battery, or to reduce the battery voltage to a defined level. The same attention should be paid to the discharging process as charging. The final discharge voltage should be set up correctly to avoid deep-discharging. Lithium battery can not be discharged to lower than the minimum voltage, or it will cause a rapid loss of capacity or a total failure. Generally, lithium battery doesn't need to be discharged. Please pay attention to the minimum voltage of lithium battery to protect the battery.
- Some rechargeable batteries have a memory effect. If they are partly used and recharged before the whole charge is accomplished, they remember this and will only use that part of their capacity next time. This is a memory effect. It is said that NiCd and NiMH batteries are suffering from memory

effect. NiCd has more memory effect than NiMH.





BATT PROG / STOP Button:

Used to stop the progress or go back to previous step/screen

DEC Button:

Used to go through the menus and decrease the parameter value

INC Button:

Used to go through the menus and increase the parameter value

ENTER/START:

Used to enter parameter or store parameter on screen

When you are ready to alter the parameter value in the program, press the START/ENTER button to make it blink then change the value by pressing DEC and INC button. The value will be stored by re-pressing the START/ENTER button. If there is another parameter it can be altered in the same screen, when you confirm the first parameter value, the next parameter value will start to blink which means it is ready to alert.

When you are ready to start the progress, press and hold the START/ENTER button for 3 seconds. When you want to stop the progress or go back to the previous step/screen, press the BATT PROG/STOP button once.

When you power on the charger, it will enter the LiPo Battery balance program directly. You could change the mode (balance mode, normal charge mode, fast charge mode, store mode or discharge mode), enter the desired charging/discharging mode, set the referred parameter and start the progress.

If you have no request for LiPo Battery program, please press the BATT Prog/STOP button to enter BATT PROGRAM screen.

OPERATING PROGRAM

Here is the detailed procedure to make the charger work. All the screens and operations will take Li-Po BALANCE CHARGE program for example.

Connection

1. Connecting to Power Source

The unit comes with the built in switching power supply. You can connect the AC power cord directly to the main AC socket.

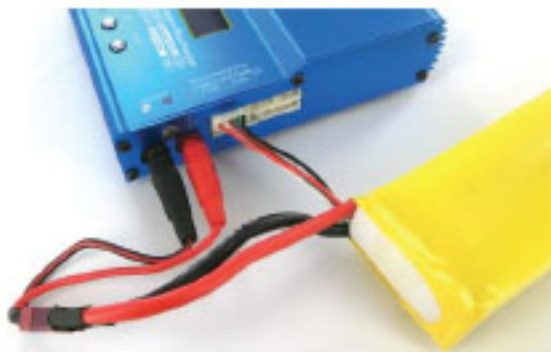
2. Connecting the Battery

IMPORTANT! Before connecting a battery it is absolutely essential to check one last time that you have set the parameters correctly. If the settings are incorrect, the battery may be damaged, and could even burst into flames or explode. To avoid short circuits between the banana plugs, always connect the charge leads to the charger first, and only then to the battery. Reverse the sequence when disconnecting the pack.

3. Balance Socket

IT IS FOR LITHIUM BATTERY IN ALL MODES

The balance wire attached to the battery must be connected to the charger with the black wire aligned with the negative marking. Take care to maintain correct polarity! This diagram shows the correct way to connect your battery to the unit while charging in the balance charge program mode.



WARNING: Failure to connect as shown in this diagram will damage this charger.

To avoid short circuit between the charge lead always connect the charge cable to the charger first, the connect the battery. Reverse the sequence when disconnecting.

Getting Started

Locate the flowcharts show the entire programming menu. It is highly recommended to have these flowcharts handy while learning to operate this charger. There are two main ways in which to set the charger.

1. A memory profile is available for setting and storing pertinent information for up to 10 different batteries. Once a battery's information is stored into a memory it will be retained until changed again manually. Recalling a battery's memory number makes the charger instantly ready to go!
2. If you do not wish to use the battery memories, this charger can be manually set before each use.

For the following steps, all are based on manual set

BATT/PROGRAM
LiPo BATT

START/ENTER

LiPo BALANCE CHG
2. 0A 11.1U <3S>

START/ENTER

LiPo BALANCE CHG
2. 0A 11.1U <3S>

START/ENTER

LiPo BALANCE CHG
2. 0A 11.1U <3S>

START/ENTER

LiPo BALANCE CHG
2. 0A 11.1U <3S>

START/ENTER
> 3 Seconds

BATTERY CHECK
WAIT...

R: 3SER S: 3SER
CANCEL <STOP>

3. BATT/PROGRAM Select

Press INC and DEC to go through all the programs and press START/ENTER to enter LiPo BATT Program.

4. Mode Select

Press INC and DEC to go through all the modes and press START/ENTER to enter LiPo Balance Charge Mode.

5. Battery Setting

Press START/ENTER, the current value will start to blink, press INC and DEC to change the value and press START/ENTER to confirm your setting. At the same time, the battery cells number will start to blink, press INC and DEC to change the value and press START/ENTER to confirm your setting.

6. Program Start

Press and hold START/ENTER for 3 seconds to start the program.

The charger is detecting the battery cell.

R shows the number of cells detected by the charger and S is the number of cells set by you at the previous screen. If both numbers are not identical, press STOP to go back to previous screen to recheck the number of cells of the battery pack before going ahead.

R: 3SER 8: 3SER
CONFIRM(CENTER)

↓ START/ENTER

LP4s 1.5A 12.14V
BAL 000:50 00022

LP4s 1.5A 12.14V
BAL 000:50 00022

↑ INC ▶

4.07 4.06 4.11 U
0.00 0.00 0.00 U

▶ ↑ INC

Fuel= 90%
Cell= 4.10U

LP4s 1.5A 12.14V
BAL 000:50 00022

◀ ↑ DEC

End Voltage
12.6UCSS)

◀ ↑ DEC

IN Power Voltage
12.56U

◀ ↑ DEC

Ext. Temp ----
Int. Temp 37°C

◀ ↑ DEC

Temp Out-Off
50°C

◀ ↑ DEC

Safety Time
ON 200min

◀ ↑ DEC

Capacity Cut-Off
ON 5000-Ah

7. Charging Status Monitor

During the charge process, real-time status will be shown as the left screen.

Various Information During the Process

Press INC or DEC during charging or discharging process, you can inquire various information on LCD screen.

Real-time status: battery type, battery cell, charge current, battery voltage, elapsed time and charged capacity.

Voltage of each cell in the battery pack when the battery is connected with balance lead.

Charged capacity percentage and average cell voltage of the battery pack.
Final voltage when the program ends.

Input voltage.

Internal temperature.

Temperature probe is needed to show external temperature.

Cut off temperature.

Safety timer ON and duration of time in minutes.

Capacity cut-off ON and the setting value of capacity.

8. Program Stop

During the charging process, press STOP to stop the charging process.

9. Program Complete

When the charging process finished, an audible sound will be heard.

Charging Program

Depends on different battery type, the operation programs are different.

Battery Type	Operating Program	Description
LiPo LiIon LiFe LiHV	CHARGE	This charging mode is for charging LiPo/LiFe/LiIon/LiHV batter in normal mode.
	DISCHARGE	This mode is for discharging LiPo/LiFe/LiIon/LiHV battery.
	STORAGE	This program is for charging or discharging lithium batteries which will not be used for a long time.
	FAST CHG	The charging capacity may be a bit smaller than normal charging but the process time will be reduced.
	BAL CHARGE	This mode is for balancing the voltage of lithium-polymer battery cells while charging.

NIMH/ NiCd	CHARGE	The charger will charge NiMH and NiCd batteries using the charge current set by the user.
	AUTO CHG	In this program the charger detects the condition of the battery which is connected to the output and automatically charges the battery. NOTE: You should set up the upper limit of the charge current to avoid damage by excessive feeding current. Some batteries of low resistance and capacity can lead to higher current.
	DISCHARGE	This mode is for discharging NiMH/NiCd battery.
	RE-PEAK	In re-peak charge mode, the charger can peak charge the battery once, twice or three times in a row automatically. This is good for confirming the battery is fully charged, and for checking how well the battery receives fast charges.
	CYCLE	1 to 5 cyclic and continuous process of charge>discharge or discharge>charge is operable for battery refreshing and balancing to stimulate the battery's activity.
Pb	CHARGE	This mode is for charging Pb battery.
	DISCHARGE	This mode is for discharging Pb Battery

BATTERY MEMORY SET AND CALL OUT

The charger can store up to 10 different charge/discharge profiles for your convenience, and the stored profiles can be recalled quickly without having to go through the setup process. When you are willing to alter the parameter value in the program, press START/ENTER to make it blink then change the value with INC or DEC. The value will be stored by pressing START/ENTER once.

NOTE: All following screen are taking 2S(7.4V) LiPo battery for example.

[BATT MEMORY 1]
ENTER SET->

START/ENTER

BATT TYPE
LiPo

◀DEC INC▶

BATT VOLTS
7.4V C 2S

◀DEC INC▶

CHARGE CURRENT
4.9A

◀DEC INC▶

DSCH CURRENT
2.9A

◀DEC INC▶

DSCH VOLTAGE
3.9V/CELL

1. Battery Memory Set

Enter the battery memory program. (10 different charge/discharge profiles can be stored).

- Set the battery type (LiPo/LiFe/Lilon/LiHV/ NiMH/NiCd/Pb).
- Set the voltage and number of cells (1S-6S).
- Set the charge current (0.1-6.0A).
- Set the discharge current (0.1A-2.0A).
- Set the discharge voltage (3.0-3.3V/Cell).
- Set the terminal voltage (4.18-4.25V).
- Press ENTER to save program.

SAVE PROGRAM
SAVE

[BATT MEMORY 1]
LiPo 7.4V C250

[BATT MEMORY 1]
C: 4.9A D: 2.2A

START/ENTER
>3 Seconds

ENTER CHARGER
LOAD

LiPo BALANCE CHG
4.9A 7.4V(C250)

- Indicate the battery type and battery cell of the saved profile.
- Indicate the charge and discharge current of the saved profile.
- Press the START/ENTER for 3 seconds to call out the memory.

2. Battery Memory Call Out

Load the memory set.

- Press START/ENTER for 3 seconds to start the process

SYSTEM SETTING

It will be operated with the default value of the essential user settings when it is powered on for the first time. The screen displays the following information in sequence and the user can change the value of parameter on each screen.

When you are willing to alter the parameter value in the program, press START/ENTER to make it blink then change the value with INC or DEC. The value will be stored by pressing START/ENTER once.

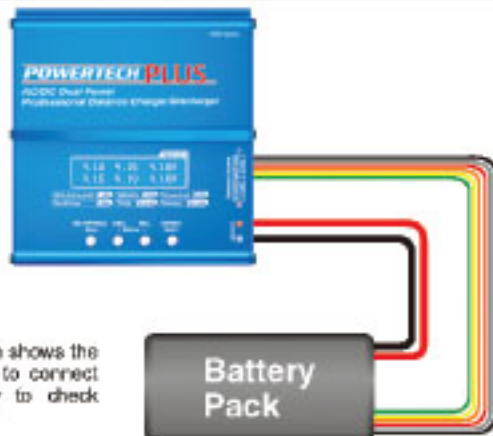
Item	Selection	Description
Safety Timer ON 120min	OFF/ON (1-720 Min)	When you start a charge process, the integral safety timer automatically starts running at the same time. This is programmed to prevent overcharge the battery if it proves to be faulty, or if the termination circuit cannot detect the battery full. The value for the safety timer should be generous enough to allow a full charge of the battery.
Capacity Cut-Off ON 5000mAh	OFF/ON (100-50000 mAh)	This program sets the maximum charge capacity that will be supplied to the battery during charge. If the delta peak voltage is not detected not the safety timer expired by any reason, this feature will automatically stop the process at the selected capacity value.
Temp Cut-Off ON 58 C 122 F	OFF/ON (20°C/68°F - 80°C/176°F)	The battery's internal chemical reaction will cause the temperature of the battery to rise. If the temperature limit is reached, the process will be terminated.
Temperature Unit Celsius	Celsius Fahrenheit	You can choose the temperature displayed by Celsius or Fahrenheit as you like.
Rest Time CHG/DCHB 10min	1.60Min	A rest time allowing the battery to cool down between charging/discharging cycle.
NiMH Sensitivity D.Peak Default	Default: 4mV/ Cell 5-15mV/ Cell	This program is for NiMH/NiCd battery only. When the charger detects the delta peak value reaches the value you set, the charger will say the battery is fully charged.
NiCd Sensitivity D.Peak Default	OFF/ON	The beep sounds at every time touching the buttons to confirm your action. The beep or melody sounded at various times during operation to alert different mode changes.

Key Beep ON Buzzer ON	10.0-11.0V	This program monitors the voltage of input battery. If the voltage drops below the value you set the operation forcibly terminated to protect the input battery.
Input Power Low Cut-Off 11.8V		Press ENTER to load factory default setting.
Load Factory Set Enter		It indicates the hardware and firmware version.
Version HW: 1.00 FH: 1.10		It indicates the unique serial number of this charger.

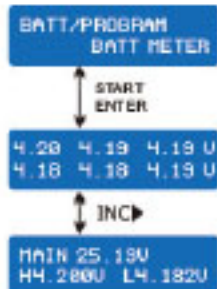
BATTERY METER

The user can check battery's total voltage, the highest voltage, the lowest voltage and each cell's voltage.

Please connect the battery to the charger main battery lead to battery socket and balance wires to balance socket.



This diagram shows the correct way to connect your battery to check the voltage.

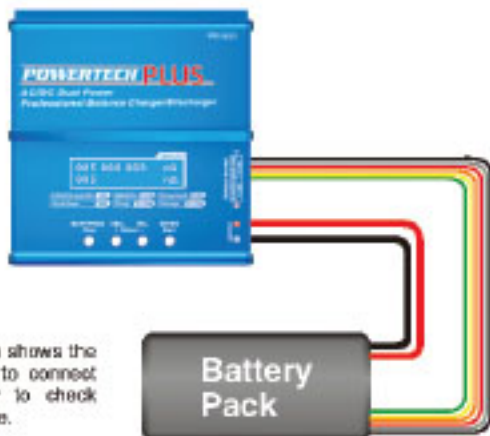


- Press the START/ENTER to enter the Lithium Battery Meter Program.
- The screen indicates each cell's voltage.
- The screen indicates the total voltage, the highest voltage and the lowest voltage.

BATTERY RESISTANCE METER

The user can check battery's total resistance, the highest resistance, the lowest resistance and each cell's resistance.

Please connect the battery to the charger main battery lead to battery socket and balance wires to balance socket.



This diagram shows the correct way to connect your battery to check the resistance.

BATT./PROGRAM
BATT. RESISTANCE

Start
Enter

012 005 005 nΩ
006 nΩ

INC▶

TOTAL: 28nΩ
Hi: 12nΩ Li: 5nΩ

- Press the START/ENTER to enter the Lithium Battery Resistance program.

- The screen indicates each cell's resistance.

- The screen indicates the total resistance, the highest resistance and the lowest resistance.

WARNING & ERROR MESSAGE

In case of an error the screen will display the cause of error and emit an audible sound.

REVERSE POLARITY

- Incorrect polarity connected.

CONNECTION BREAK

- The battery is interrupted.

CONNECT ERROR
CHECK MAIN PORT

- The battery connection is wrong.

BALANCE CONNECT
ERROR

- The balance connect is wrong.

DC IN TOO LOW

- Input voltage less than 11V.

DC IN TOO HIGH

- Input voltage higher than 18V.

CELL ERROR
LOW VOLTAGE

- Voltage of one cell in the battery pack is too low.

CELL ERROR
HIGH VOLTAGE

- Voltage of one cell in the battery pack is too high.

CELL ERROR
VOLTAGE- INVALID

- Voltage of one cell in the battery pack is invalid.

CELL NUMBER
INCORRECT

- The cell number is wrong.

INT. TEMP. TOO HI

- Internal temperature of the unit goes too high.

EXT. TEMP. TOO HI

- External temperature of the battery goes too high.

OVER CHARGE
CAPACITY LIMIT

- Battery capacity is more than the maximum capacity which the user sets.

OVER TIME LIMIT

- Charging time is longer than the maximum charging time which the user sets.

BATTERY HAS FULL

- Battery voltage is higher than the maximum voltage which the user sets when charging in balance mode.

NO BALANCE CABLE
DETECTED

- Balance connection is suggested for all lithium process (charge/discharge/storage/fast charge/balance charge), if your battery comes without balance lead, push enter to start.

USING THE CHARGE CONTROL SOFTWARE

The free "Charge Master" software gives you unparalleled ability to operate the charger through the computer. You can monitor pack voltage, cell voltage and other data during the charging, view charge data in real-time graphs. And you can initiate, control charging and update firmware from "Charge Master".

In order to connect the charger to the computer and use the "Charge Master", you are required to use a USB cable which is

not included in this package. The cable must be terminated on one end with "A" plug and the opposite end is terminated with "micro-B" plug which can connect to charger directly.

The "Charge Master" can be downloaded from:
www.jaycar.com.au

BOX CONTENTS

- 1 x 12/240V Professional Balance Charger / Discharger
- 1 x Mains Power Cable
- 1 x T Plug with Banana Connectors Charging Cable
- 1 x DC Cable with Alligator Clips Charging Cable
- 1 x T Plug with Alligator Clips Charging Cable
- 1 x T Plug with Futaba Connector Charging Cable
- 1 x T Plug with JST Connector Charging Cable
- 1 x T Plug with XT60 Connector Charging Cable



SPECIFICATIONS

PC Communications:	USB Port for PC Control & Firmware Upgrade
External Port:	2-6S Balance Socket-XH, Temperature Probe Socket, Battery Socket, DC Input, Micro USB Port for PC.
Delta Peak Detection for NiMH/NiCd:	5-15mV/cell Default: 4mV/cell
Charge Cutoff Temperature:	20°C/69°F-80°C/176°F (adjustable)
Charge Voltage:	
NiMH/NiCd:	Delta peak detection
LiPo:	4.18-4.25V/cell
Lilon:	4.08-4.2V/cell
LiFe:	3.58-3.7V/cell
LiHV:	4.25-4.35V/cell
AC Input:	100-240V
DC Input:	11-18V
Circuit Power:	50W Max.
Max. Discharge Power:	5W
Charge Current Range:	0.1-6A
Safety Timer:	1-720minutes off
Discharge Current Range:	0.1-2.0A
Discharge Cut-off Voltage:	
NiMH/NiCd:	0.1-1.1V/cell
LiPo:	3.0-3.3V/cell
Lilon:	2.9—3.2V/cell
LiFe:	2.6-2.9V/cell LiHV: 3.1-3.4V/cell
Pb:	1.8V
Current Drain For balance:	200mA/cell

LiPo/LiFe/Li-ion/LiHV Cell Count:	1-6cells
NiCd/NiMH Battery Cell Count:	1-15cells
Pb Battery Voltage:	2-20V
Dimensions :	138(W) x 144(D) x 141(H)mm
Balance Cells:	2-6 cells
Memory:	10 different charge / discharge profiles
Charge Method:	CC/CV for lithium types and lead (Pb) batteries Delta-peak Sensitivity for NiMH/NiCd

COMMONLY USED TERMS

Final charge voltage: the voltage at which the battery's charge limit (capacity limit) is reached. The charge process switches from a high current to a low maintenance rate (trickle charge) at this point. From this point on further high current charging would cause overheating and eventual terminal damage to the pack.

Final discharge voltage: the voltage at which the battery's discharge limit is reached. The chemical composition of the batteries determines the level of this voltage. Below this voltage the battery enters the deep discharge zone. Individual cells within the pack may become reverse polarised in this condition, and this can cause permanent damage.

A, mA: unit of measurement relating to charge or discharge current. 100mA = 1A (A = Ampere, mA = Milliampere).

Ah, mAh: unit of measurement for the capacity of a battery

(Amperes x time unit; h = hour). If a pack is charged for one hour at a current of 2A, it has been fed 2Ah of energy. It receives the same quantity of charge (2Ah) if it is charged for 4 hours at 0.5A or 15minutes (=1/4h) at 8A.

'C' -rating: Capacity is also referred to as the 'C' rating. Some battery suppliers recommend charge and discharge currents based on the battery 'C' rating. A battery's '1C' current is the same number as the battery's rated capacity number, but noted in mA or amps. A 600mAh battery has a 1C current value of 600mA, and a 3C current value of (3 x 600mA) 1800mA or 1.8A. The 1C current value for a 3200mAh battery would be 3200mA (3.2A).
Nominal voltage (V): The nominal voltage of the battery pack can be determined as follows:

- NiCd or NiMH: multiply the total number of cells in the pack by 1.2. A 8-cell pack will have a nominal voltage of 9.6 volts (8x1.2).
- LiPo: Multiply the total number of cells in the pack by 3.7. A 3-cell LiPo wired in series will have a nominal voltage of 11.1 volts (3x3.7).
- Lilo: Multiply the total number of cells in the pack by 3.6. A 2-cell Lilo wired in series will have a nominal voltage of 7.2 volts (2x3.6).
- LiFe: Multiply the total number of cells in the pack by 3.3. A 4-cell Lilo wired in series will have a nominal voltage of 13.2 volts (4x3.3).

If the nominal voltage of the battery is not printed on the battery's label, consult your battery manufacturer or supplier. Do not guess the rated voltage of battery.

WARRANTY & SERVICE

Liability Exclusion

This charger is designed and approved exclusively for use with the types of battery stated in this Instruction Manual. Electus Distribution accepts no liability of any kind if the charger is used for any purpose other than that stated.

We are unable to ensure that you follow the instructions supplied with the charger, and we have no control over the methods you employ for using, operating and maintaining the device. For this reason we are obliged to deny all liability for loss, damage or costs which are incurred due to the incompetent or incorrect use and operation of our products, or which are connected with such operation in any way. Unless otherwise prescribed by law, our obligation to pay compensation, regardless of the legal argument employed, is limited to the invoice value of those products which were immediately and directly involved in the event in which the damage occurred.

Warranty & Service

THIS WARRANTY IS ONLY VALID IN THE COUNTRY OF PURCHASE AND THROUGH FORMAL DISTRIBUTOR

We guarantee this product to be free of manufacturing and assembly defects for a period of one year from the time of purchase. The warranty only applies to material or operational defects, which are present at the time of purchase. During that period, we will repair or replace free of service charge for products deemed defective due to those causes.

For any repair or replace service, please contact your place of purchaser in the first instance, who is responsible for processing guarantee claims. This warranty is not valid for any damage or subsequent damage arising as a result of misuse, modification or as a result of failure to observe the procedures outlined in this manual.

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