

AD 1

Touch screen fast charger / discharger



Instruction manual

TABLE OF CONTENTS

INTRODUCTION.....	01
SPECIFICATION.....	03
MAIN FEATURES.....	04
WARNING AND SAFETY NOTES.....	06
PROGRAM FLOW CHART.....	09
PROGRAM DESCRIPTION.....	10
OPERATING PROGRAM.....	11
Touch Screen Operation.....	11
Connection.....	12
CHARGING PROGRAM.....	13
DISCHARGE PROGRAM.....	15
Storage Program for Lithium Battery.....	17
BATTERY MEMORY.....	18
Data view.....	19
LITHIUM BATTERY BALANCER.....	20
Digital Power.....	21
Forming Charge.....	22
SYSTEM SETTING.....	23
ERROR MESSAGE.....	26
AUTHENTICATION INFORMATION.....	28
WARRANTY.....	29

INTRODUCTION

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.

AD1 integrates battery technology together with touch-operated system. It is equipped with a 128*64 pixel resistive touch screen, which plays very important role in the entire system. Every operating procedure and status change can be shown on this screen, making the operating procedures very intuitive. When the battery is working, you can directly check the battery capacity, battery voltage, charging time and internal resistance on the screen. Additionally, the entire charging procedures can be recorded and generated into a charging curve for you to check on the screen.

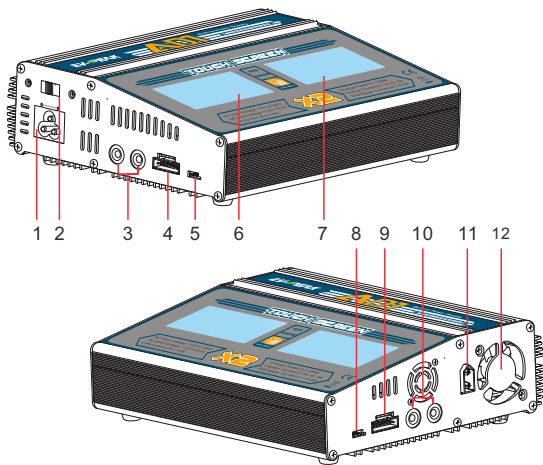
AD1 comes with a memory module. Users can edit and save parameters of different batteries. Once the battery parameters are edited, the shortcut for parameters will be generated on the screen, which provides a simple on-click interface for users.

AD1 is built-in switching power supply. It can be powered up with 12V car battery or 110V or 220V AC input, suitable for use with LiPo / LiFe / LiHV / Li-Ion / NiMH / NiCd / Pb battery. maximum 10A charge current and maximum 100W charge power. Integrated high-performance micro processor and high-efficient cooling system, control the charger always under a safety temperature situation.

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

It can be dangerous to mishandle 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.



- | | |
|--------------------------------|--------------------------------|
| 1. AC input | 7. CH2 Touch screen |
| 2. 110V or 220V switch | 8. CH2 temperature Sensor Port |
| 3. CH1 output | 9. CH2 balance port |
| 4. CH1 balance port | 10. CH2 output |
| 5. CH1 temperature Sensor Port | 11. DC input |
| 6. CH1 Touch screen | 12. cooling fan |

SPECIFICATIONS

- DC input Voltage: 11-18V
- AC input Voltage: 110V or 220V
- Control: Touch system
- Backlight: Blue
- Charge current: 0.1A-10.0A x2
- Balance tolerance: $\pm 0.01V$
- Balance power: max. 350W
- Charge power: max. 100W x2
- Display Type: LCD resistive touch screen
- Cooling system: cooling fan
- Dimension: 240 x170 x56 mm
- Weight: 1250g
- Safety timer: 1-720min or turn off
- Discharge current: 0.1A-5.0A x2
- Discharge power: max. 12W x2
- Memory: 20 different charge/discharge profiles
- External port: 1-6S Balance Socket-XH
Temperature probe socket
AC Input socket
DC Input socket
Micro USB for PC
- Battery Types/cells: LiPo/Lilon/LiFe/LiHV: 1-6S
NiMH/NiCd: 1-15cells
Pb: 2-24V
- Charge Voltage: LiPo: 4.18-4.22V/cell
Lilon: 4.18-4.20V/cell
LiFe: 3.68-3.80V/cell
LiHV: 4.30-4.40V/cell
- 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

Touch System

With the graphic touch controlled interface, the resistive touch LCD screen intuitively displays every charging status & information, which makes the operating procedures very easy. Users can enjoy a more convenient and comfortable “touch” experience.

Optimized Operating Software

AD1 simplifies and optimizes the operating procedures for users, it can maximumly protect your battery safety, and prolong the lifetime of the battery effectively; what's more, the charger allows users to self-define the charging parameters, so that you can configure other charging parameters according to your own requirements.

Charging Status Monitor

When the charger is working, you can check the charging capacity, battery voltage, charging time and internal resistance on the screen. More important, the voltage curve can be displayed on the screen, so you can monitor the charging status.

Internal Independent Lithium Battery Balancer

AD1 Charger 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, AD1 can monitor and balance each cell of the battery individually. Error message will be indicated and process will be ended automatically if the voltage of any single one cell is abnormal.

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

Independent Balance function

When the battery performance declines and voltage difference increases, the balance function of charger will to work. The equalizer circuit will work independently and reduce the voltage difference to below 0.01V, which can prolong the lifetime of battery and reduce risks due to over discharge.

MAIN FEATURES

Memory Preset

The charger can store up to 20 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 set the charge/discharge and voltage.

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.

Processing Time Limit

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

PC Control Software "Charge Master"

Please download the "PC Monitor" software on our website: www.ev-peak.com. There is a mini USB port in the charger which can be used to connect it to the PC. You need optional USB cable (USB A Male to Mini B Male) which is not included in the package. The free "Charge Master" software gives you unparalleled ability to operate the charger through your computer. You can update firmware from "Charge Master".

Inner Resistance of Battery Pack

Measure inner resistance of battery pack inclusively all connections and leads.

Regenerative Discharging

The user can transfer the battery energy to the car battery or other energy storage equipment.

WARNING AND 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.



WARNING



Fire Hazard!

-  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. 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 11~18V DC. The allowable AC input voltage is 110V or 220V AC.
-  This charger and the battery should be put on a heat-resistant, nonflammable and nonconductive 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.
-  To avoid short-circuiting between the charge lead, always connect the charge cable to the charger first, then connect the battery. Reverse the sequence when disconnecting.

WARNING AND SAFETY NOTES

⚠ 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).
- 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.

✂ Standard Battery Parameters

	LiPo	Lifon	LiFe	LiHV	NiCd	MiMH	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	3.0-3.3V/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.

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 quickcharge 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 goldplated 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 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.

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-dis-charging. 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 them. Lithium batteries are recommended to be discharged partially rather than fully. Frequent full discharging should be avoided if possible.

PROGRAM DESCRIPTION

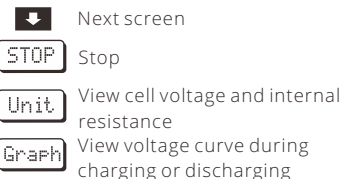
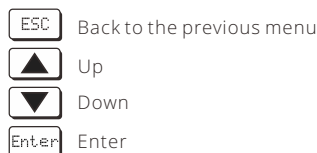
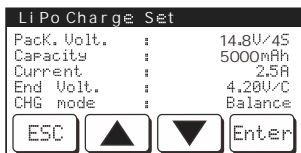
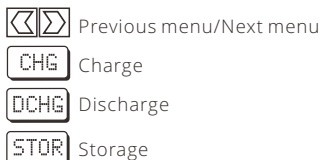
Depends on different battery types, the operating programs are different

Battery type	Operation Program	Description
LiPo Lilon LiFe LiHV	Balance Charge	This charging mode is for charging LiPo/ LiFe/ Lilon/ LiHV battery in normal mode.
	Storage	This program is for discharging LiPo/ LiFe/ Lilon/LiHV battery which will not be used for long time.
	Discharge	This mode is for discharging LiPo /LiFe /Lilon /LiHV battery.
	Fast charge	This charging mode is for charging LiPo /LiFe /Lilon /LiHV battery in normal mode without balancing.
NiMH NiCd	Auto mode	Charger automatically detects the connected NiMH/NiCd battery and control the charging current in the affordable range, and limit the maximum current does not exceed the setting value. Attention: Ensure to set the maximum charging current, or it may overcharge and damage the battery.
	Man mode	Charger will charge the battery with setting current.
	Discharge	Charger will discharge the battery with setting current, operation same as lithium battery.
	Cycle	To increase the remaining usable battery life, cycling is strongly recommended. charger supports 1-5 times of charge > discharge or discharge > charge cycle.
Pb	Charge	This mode is for charging Pb battery
	Discharge	This mode is for discharging Pb battery.

OPERATION PROGRAM

1.Touch Screen Operation

- 1). Press the Left and Right Arrows on the LCD Touch Screen to scroll through the main menu screens.
- 2). Press the action at the button of the LCD Touch Screen to enter that menu.
- 3). Press a parameter to highlight that parameter.
- 4). Press the Up and Down Arrows to edit the parameter.
- 5). Press "Enter" for more than 2 seconds to save the parameter and start working.
- 6). If there is more than one screen of parameters, press the top right corner of the LCD Touch Screen to scroll through the parameter screens.
- 7). Press "ESC" to return to the previous menu.
- 8). Press "Stop" to stop working.



2.Connection

The following describes the action process of the charger, in order to lithium polymer battery charging program as an example.

1) Connecting power

AD1 comes with the built in switching power supply. You can connect the AC power cord directly to the main AC socket (110V or 220V AC) or attaching directly to 12V car batteries.

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. .

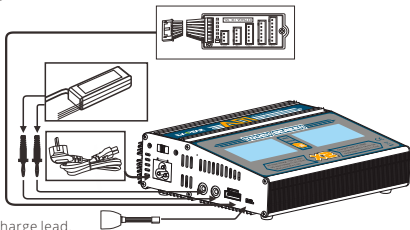
3)Balance Socket

The balance wire attached to the battery must be connected to the charger with the negative marking. Take care to maintain correct polarity!
(See the wiring diagram below.)

⚠️Ensure to connect the battery to balance port when charging LiPo, Lilon, LiFe and LiHV battery under balance mode.

Connection Steps

1. Connect the charger AC or DC input cable to a power source.
2. Connect the charge lead and balance adapter board to charger, making sure that the positive and negative connectors are not reversed.
3. Insert the battery balance lead to balance adapter board.
4. Connect the battery connector to the charge lead.
5. Select the program and charging settings.
6. Start battery charging



WARNING:

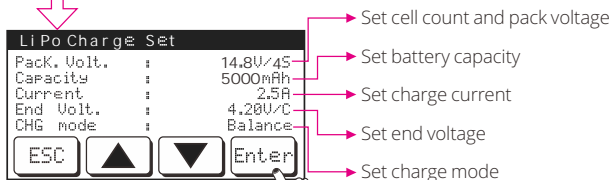
Failure to connect as shown in this diagram will damage this charger. To avoid short circuit between the charge lead always connect the charge cable to the charger first, then connect the battery. Reverse the sequence when disconnecting.

OPERATION PROGRAM

3. Charge program

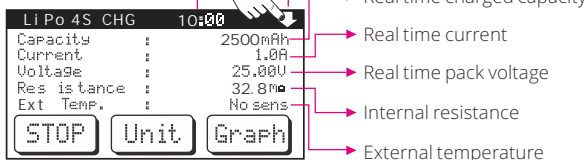
In this program, user can set the cell count, battery pack voltage, battery capacity, charge current, end voltage and charge mode, press Enter for more than 2 seconds to start charging.

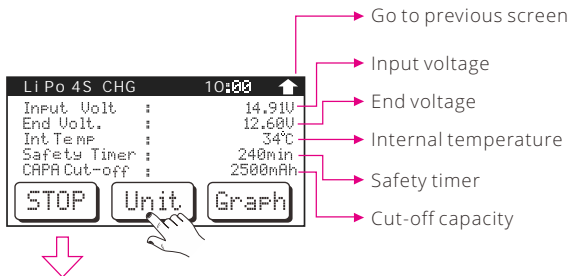
Notice: According to the battery capacity setting, charger will automatically set the charge current at a rate of 1C.



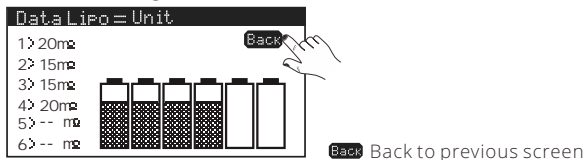
Press Enter>2S=Start

1). Charging status

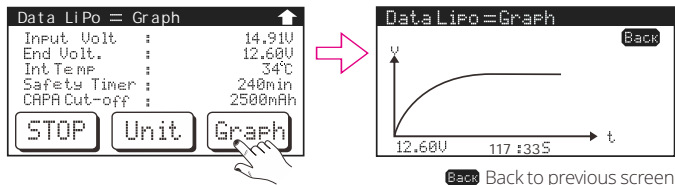




2).View cell voltage and cell resistance



3).View voltage curve graph during charging



4).Stop process finished

Press the "STOP" button to stop charging

5).Process finished

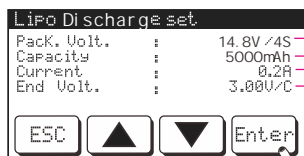
Charger will alarm once program finished

OPERATION PROGRAM

4. Discharge program

In this program, user can set the cell count, battery capacity, discharge current and end voltage.

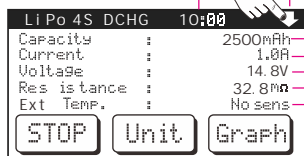
Attention: Set the correct discharge end voltage, or it will cause over discharge and damage the battery.



Press Enter>2S=Start

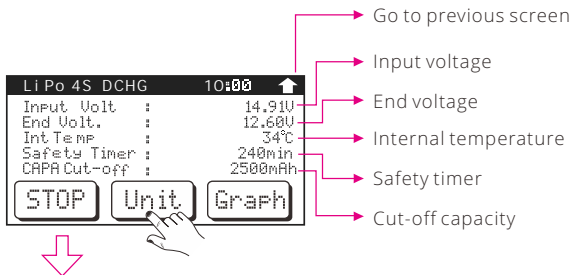
- Set cell count and pack voltage
- Set battery capacity
- Set discharge current
- Set end voltage

1). Discharging status

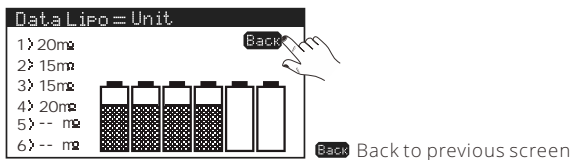


- Elapsed time
- Go to next screen
- Real time discharged capacity
- Real time current
- Real time pack voltage
- Internal resistance
- External temperature

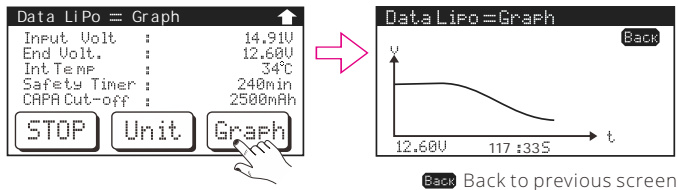




2).View cell voltage and cell resistance



3).View voltage curve graph during discharging



4).Stop process finished

Press the "STOP" button to stop charging

5).Process finished

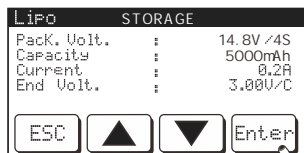
Charger will alarm once program finished

OPERATION PROGRAM

5.Storage Program for Lithium Battery

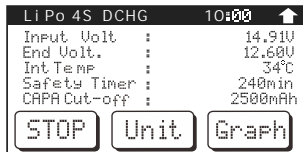
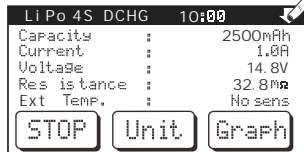
"STORAGE" is a function which is specialized for Lithium battery storage, its operation is same as the discharge program. To store for a long time and protect useful time of the battery, it automatically charge/discharge the battery to a safe voltage.

For different battery type, the end voltage are different, LiPo:3.85V, LiHV:3.85V, LiFe:3.3V, Lilon:3.75V. This is a intelligent program, it detects the battery voltage and automatically charge or discharge the battery. make sure to connect the battery to balance port when use this program.



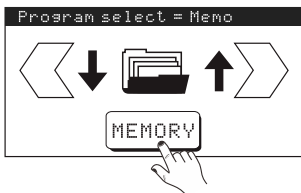
Press Enter>2S=Start

Real time status during storage



6. Battery Memory

The charger can store up to 20 different charge/discharge profiles for your convenience, and the stored profiles can be recalled quickly without having to go through the setup process.

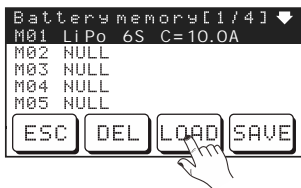


1). Save

When you finish setting the charging/discharging/storage parameters, please press ESC to return to the main menu screen, and go to MEMORY screen.

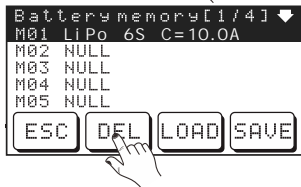


Press SAVE, the parameters you just entered will be saved.



2). Recall

To use a memory file, press it, then press LOAD



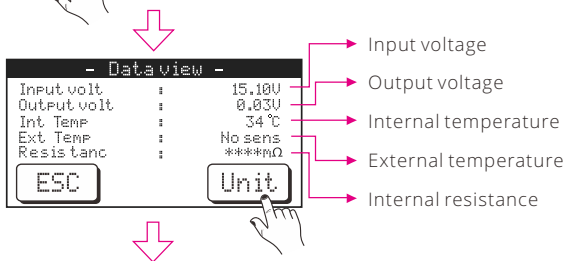
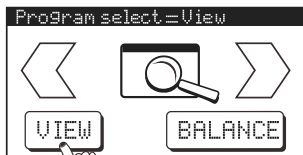
3). Delete

To delete a memory file, press it, then hold DEL for more than 2 seconds.

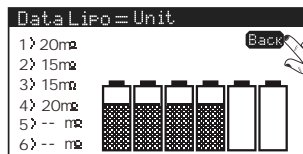
OPERATION PROGRAM

7.Data view

With this program, user can check the battery cell voltage, internal resistance, input voltage, output voltage, inner temperature and external temperature. Please connect the battery to charger output port. (both main output and balance port).



Cell voltage and cell resistance

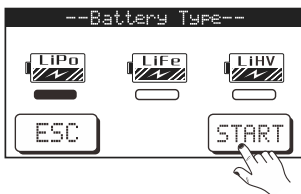
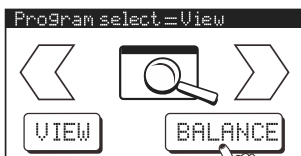


"Back" Back to the previous screen

8.Lithium battery balancer

This function is for unbalanced lithium battery pack, set the correct battery type when using this program, or it will damage the battery.

The equalizer circuit will work independently and reduce the voltage difference to below 0.02V, which can prolong the lifetime of battery and reduce risks due to over discharge.



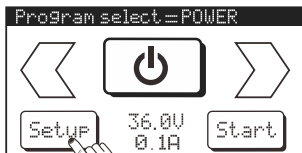
CAUTION:

Please check the battery type and settings carefully, or it may damage the battery

OPERATION PROGRAM

9. Digital Power

In this mode, charger can provide a output power of DC 3.0V-24V for other device.



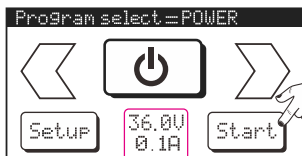
- Set output voltage
- Set output current
- Set output power



Press Enter>2S=Start



- Real time output voltage
- Real time output current
- Real time output power



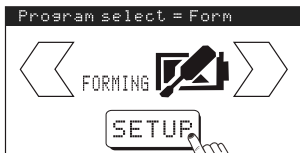
A0

Press Start >2S

A0: It shows the last setting here, press Start for more than 2 seconds to start if do not need any changes.

10. Forming Charge

For long time not used NiMH/NiCd battery, charger will charge the battery pack by a low current for a long time, which can depolarize and reactive battery.



NiMH/NiCD Formine SET

Capacity	:	5000mAh
Current	:	100mA
Time limit	:	14hours
Trickle	:	OFF

ESC ▲ ▼ Enter

- Capacity
- Current, ranges from 10mA to 1000mA
- Time limit, ranges from 1-24 hours
- Trickle, OFF/AUTO/50mA-200mA

Press Enter>2S=Start

SYSTEM SETTING

Notice: Please set the parameters in Setup menu when charger is powered on for the first time.

This charger can recognize battery cell count automatically. It has a precharge function which can reactive the slightly over discharged battery. user can set the precharge time(normally 2 minutes) in the menu. the more battery capacity, the more time needed.

Attention: In the normal charge mode, always turn off the precharge program. DO NOT use this function unless you know the battery status very well. Stop the process immediately when battery voltage increase quite few, or it may cause danger!!!



Go to next screen

Set precharge time: OFF/1-10min.

Set temperature unit °C/°F

Set cut-off temperature, ranges from 20 °C to 80°C(68-176°F)

Set input voltage, ranges from 11.0V to 32.0V

Set Input current limited value, 1.0A-55.0A/AUTO

USER SETUP [2/4]

Safety Timer	:	240min
Back light	:	100%
Melody/Full	:	1
Button sound	:	ON
Buzzer sound	:	ON

Buttons: ESC, ▲, ▼, Enter

- Go to next screen
- Set safety timer: OFF/1-720min
- Set screen brightness: OFF/10%-100%
- Set melody
- Button sound: ON/OFF
- Set buzzer volume: ON/OFF

USER SETUP [3/4]

Balance Force	:	-1.00V
Full Force	:	0.1A
DCHG Mode	:	CC

Buttons: ESC, ▲, ▼, Enter

- Go to next screen
- Set balance force trigger voltage, for LiPo/LiFe/LiIon/LiHV battery ONLY.
- Set full force
- Set discharge mode CC or CV, for LiPo/LiFe/LiIon/LiHV/Pb battery ONLY.

Set regenerative discharge parameter: Function ON/OFF, discharge current, End voltage

USER SETUP [4/4]

< -REGEN. DCHG SET >
 < --USER_NAME_STE -- >
 < --FACTORY RESET -- >

Firmware Version: 1.00

Buttons: ESC, ▲, ▼, Enter



Regenerative DCHG SET

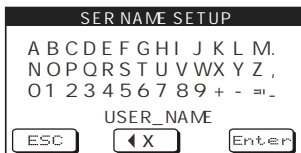
Regenerative	:	OFF
Regen. Curr in:	:	-1.0A
End Volt.	:	14.7V

Buttons: ESC, ▲, ▼, Enter

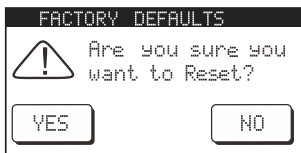
SYSTEM SETTING

Notice: When in this program, Pb battery is recommended to connect to the charger input port, DO NOT use NiMH/NiCd as a “battery power”.









User can set the user name and it will be displayed once charger powered on.











Factory reset: This operation will delete all your personal data, and reset all settings to the manufacturer default settings.



DO NOT use it unless you are sure it is necessary.

 [ERROR] REVERSE POLARITY ESC	⇒ Incorrect polarity connected
 [ERROR] PROCESS INTERRUPTED ESC	⇒ Process interrupted
 [ERROR] OUTPUT SHORT CIRCUIT ESC	⇒ Output short circuit
 [ERROR] INPUT VOLTAGE ERROR ESC	⇒ Input voltage error
 [ERROR] CHARGER FAILURE ESC	⇒ Charger fault
 [ERROR] BATTERY LOW VOLTAGE ESC	⇒ Battery total voltage is lower than setting value, please check the cell count.
 [ERROR] BATTERY HIGH VOLTAGE ESC	⇒ Battery total voltage is higher than setting value, please check the cell count.
 [ERROR] CELL LOW VOLTAGE ESC	⇒ Voltage of one cell in the battery pack is too low.

ERROR MESSAGE

- | | |
|---|--|
| 
[ERROR]
CELL HIGH VOLTAGE
ESC | ⇒ Voltage of one cell in the battery pack is too high. |
| 
[ERROR]
CELL CONNECT ERROR
ESC | ⇒ The battery balance connection is wrong. Please check the connector and cable. |
| 
[ERROR]
CHARGER OVERHEATING
ESC | ⇒ Temperature too high, please check the temperature sensor and take cooling measures. |
| 
[ERROR]
-- OVER POWER --
ESC | ⇒ Output power is higher than setting in digital power mode |
| 
[ERROR]
-- MAX CURRENT --
ESC | ⇒ Output current is higher than setting in digital power mode |
| 
-- SAFETY TIMER --
ESC | ⇒ Limited time is reached |
| 
-- MAX CAPACITY --
ESC | ⇒ Limited capacity is reached |
| 
-- MAX EXT.TEMP --
ESC | ⇒ External temperature too high |

COMPLIANCE INFORMATION FOR THE EUROPEAN UNION

European Compliance Information Declaration of Conformity



Product(s):
Item Numer(s):

Battery balance charger
AD1

The object of declaration described above is in conformity with the requirements of the specifications listed below, following the provisions of the European EMC Directive 2004/108/EC.

EN 55014-1:2006
EN55014-2:1997+A1:2001
EN61000-3-2:2006
EN61000-3-3:2008



Warranty

Thank you for purchasing this charger, we will do our best to provide you with a comprehensive after-service and protect your rights. If you have problems with this charger, please contact local distributor immediately.

We warranty this charger for a period of one year from the date of purchase. If it has a quality problem itself, all guarantee will be free. In case customers can not provide an effective certificate of purchase, we will refer the date of series number of charger. If it is over one year since the purchase date, an appropriate cost will be charged, users need bear the transportation cost back and forth.

The warranty does not cover incorrect installation, components worn by use, or any other problem resulting from incorrect use or handling of the product. No liability will be accepted for any damage resulting from the use of this product. By the act of connecting and operating this product, the user accepts all resulting liability.

Is considered incorrect use:

1. Failure to follow instructions.
2. Improper use of the product (abusive use, out of spec, etc.).
3. Failure to adapt settings for proper function (improper connections, wrong gearing, installation, setup, etc.).
4. Overload, overheating (disordering, melting, etc.).
5. Running in inadequate conditions (damage or rust from rain, humidity, etc.).
6. Improper maintenance (presence of dirt, etc.).
7. Disassembly, modification by the user (modifying original connectors, wires, components, etc.).
8. Mechanical damage due to external causes

EV-PEAK

EV-PEAK Electronic Technology(HK) Co., Ltd
www.ev-peak.com

Product specifications and information mentioned in this manual are for reference only, subject to updates without notice.