

EV-PEAK

C1-XR

AC/DC SMART BALANCE CHARGER



INSTRUCTION MANUAL

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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

EV-PEAK C1-XR integrates battery technology together with LCD screen. It is equipped with 4 function buttons. Every operating procedure and status change can be shown on LCD 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.

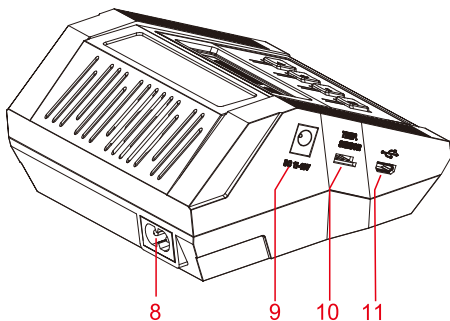
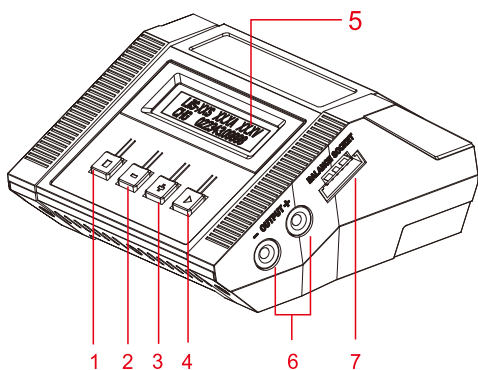
C1-XR comes with a memory module. Users can edit and save parameters of different batteries. Once the battery parameters are edited, the shortcut for parameters will be generated on the screen, which provides a simple on-click interface for users.

C1-XR is built-in switching power supply. It can be powered up with 12V car battery or 100-240V AC input, suitable for use with LiPo / LiFe / LiHV / Li-Ion / NiMH / NiCd / Pb battery.

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.Mode / ESC
- 2.- Dec.
- 3.+ Inc.
- 4.Start / Enter
- 5.LCD screen
- 6.Main Output

- 7.Balance port
- 8.AC Input
- 9.DC Input
- 10.Temperature Sensor Port
- 11.Micro-USB port

SPECIFICATIONS

- AC input Voltage: 100V –240V
- Control: Button
- Backlight: Blue
- Dimension: 130*115*61 mm
- Charge current: 0.1A-10A
- Charge power: max.100W
- Balance current: 400mA/cell
- DC input Voltage: 11–18V
- Display Type: LCD
- Cooling system: 1 cooling fan
- Weight: 380g
- Safety timer: 1-720min or turn off
- Discharge current: 0.1A-2.0A
- Discharge power: max.5W
- Memory: 10 different charge/discharge profiles
- External port: 1-6s Balance Socket-XH, Temperature probe socket, Battery Socket, DC input, AC Input, 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

Dual Power Input

The power source can be 11-18V DC input, it can be powered up at any place with a 12V car battery or 100-240V AC input. The power supply is built in and users could connect the AC Power cord to the main AC socket directly. What's more the AC input voltage is 100-240V so that the users could use charger all over the world and don't need to worry about any damage caused by improper input voltage.

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

A20 Changer employs an individual-cell-voltage balancer. It isn't neces. sary to connect an external balancer for balance charging.

Balancing Individual Cells Battery Discharging

During the process of discharging, C1-XR Charger 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

Memory Preset

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.

MAIN FEATURES

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 an 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.

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 100~240V 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	LiIon	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.

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.

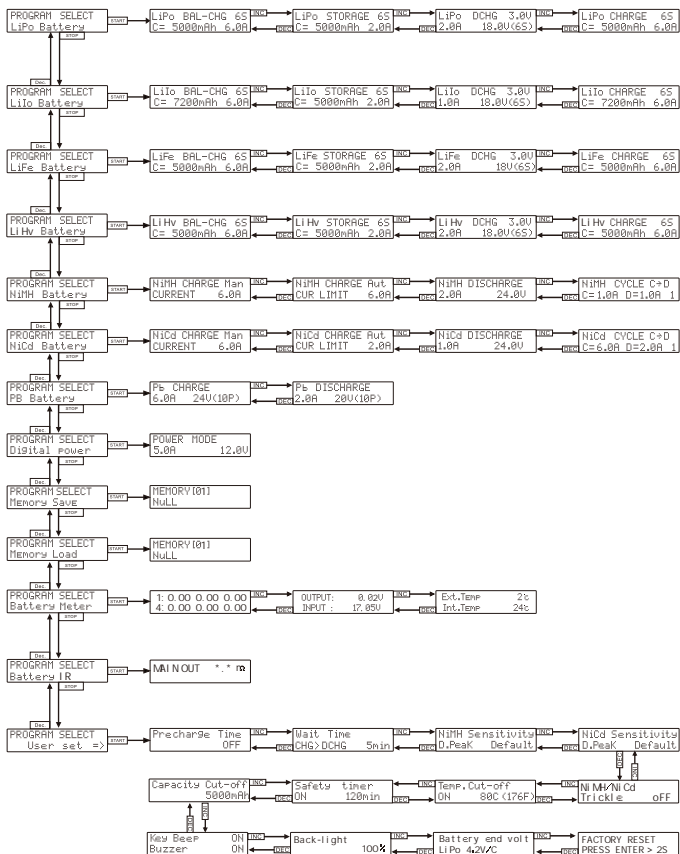
Discharging

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 them.

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

Program Flow Chart

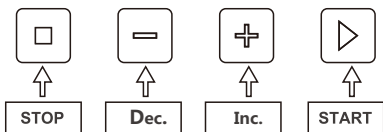


Depends on different battery types, the operating programs are different

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

Explanation of Buttons



“STOP” button

It is used to stop the process or go back to the previous step.

“Dec./-” button

It is used to go through the menus and decrease the parameter value.

“Inc./+” button

It is used to go through the menus and increase the parameter value.

“START” button

It is used to enter parameter or start program.

When you want to alter the parameter value in the program, press the START/ENTER button to make it blink and 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 which can be altered in the same screen, on confirming the first parameter value, the next parameter value will start to blink and you can set it.

When you are ready to start to program, press and hold the START/ENTER button for 3 seconds.

When you want to stop the program or go back to the previous step/screen, press the BATT PROG/STOP button once.

Here are the detailed procedures to make the charger work. All the screens and operations will take LiPo-CHARGE program for example

Connection

1).Connecting to Power Source

C1-XR comes with the built in switching power supply.You can connect the AC power cord directly to the main AC socket (100-240V AC) or attaching directly to 12V car batteries. It is critically important that you use a fully charged 13.8V car battery.

2) Connecting The Battery

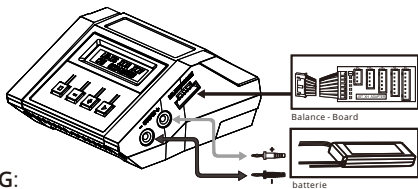
Important!!! Before connecting a battery it is absolutely essential to check one last time that you have set the parameters correctly.If the settings are incorrect, the battery may be damaged, and could even burst into flames or explode. To avoid short circuits between the banana plugs, always connect 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.)

This diagram shows the correct way to connect your battery to the AC while charging in the balance charge program mode only.

⚠ Ensure to connect the battery to balance port when charging LiPo,Lilon, LiFe and LiHV battery under balance 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, then connect the battery. Reverse the sequence when disconnecting.

OPERATION PROGRAM

Charge program

PROGRAM SELECT
LiPo Battery

START

LiPo BAL-CHG 4S
C= 5000mAh 5.0A

Dec./Inc.

LiPo BAL-CHG 4S
C= 5000mAh 5.0A

Dec./Inc.

LiPo BAL-CHG 4S
C= 5000mAh 5.0A

START

▶ 2 Seconds

Li 4S 2.0A 12.59V
BAL 022:43 00682

BATT/PROGRAM Select

Press "STOP" and "-" to go through all the programs and press "START/ENTER" to enter LiPo BATT program.

Mode Select

Press "+" and "-" to go through all the modes (balance charge mode, storage mode, discharge mode and fast charge mode).

Battery Setting

Press START, the present value will start to blink. Press "+" and "-" to set the battery cells. And press START to confirm your setting. At the same time, Press START, the present value will start to blink. Press "+" and "-" to change the value and press START to confirm your setting. Charger automatically recommend charging current according to the capacity and cell count setting value, Press START to confirm if no objection, or manually set the current by pressing "+" or "-" button, then press START to confirm.

Program Start

Press and hold START for 2 seconds to start the program.

Charging Status

It shows the real-time data during charging.

VARIOUS INFORMATION DURING THE PROCESS

Press INC or DEC during the charging or discharging process to view further pertinent information on the LCD screen.

- | | |
|--|---|
| Li4S 2.0A 12.59V
BAL 022:43 00682 | Real-time status: battery type, battery cell count, charge current, battery pack total voltage, elapsed time and charge capacity. |
| ↓ Dec. ▶ | |
| End Voltage
16.80V | Final voltage when the program ends. |
| ↓ Dec. ▶ | |
| Capacity Cut- OFF
5000mAh | Capacity cut-off ON and value of the set capacity limit. |
| ↓ Dec. ▶ | |
| Safety Time
ON 240min | Safety timer ON and duration of time in minutes. |
| ↓ Dec. ▶ | |
| TeMP Cut-off
ON 60°C (140°F) | Cut off temperature. |
| ↓ Dec. ▶ | |
| EXT. TeMP 0°C
Int. TeMP 43°F | Internal temperature. |
| ↓ Dec. ▶ | |
| INPower Voltage
14.74V | Temperature probe needs to be connected to show external temperature. |
| ↓ Inc. ▶ | |
| C1: 4.15 C2: 4.16
C3: 4.16 C4: 4.15 | Input voltage |
| ↓ Inc. ▶ | |
| C5: 0.00 C6: 0.00 | Voltage of each cell in the battery packs when the battery is connected with balance lead. |

Program Stop

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

Program Finished

Charger will alarm once program finished.

OPERATION PROGRAM

Discharge program

Warning: Ensure to set the right end voltage, or it may over-discharge the battery.

PROGRAM SELECT LiPO Battery

START

LiPO DCHG	4.0V
0.1A	15.6V(4S)

Dec./Inc.

LiPO DCHG	3.8V
0.3A	15.2V(4S)

Dec./Inc.

LiPO DCHG	3.8V
0.3A	15.2V(4S)

START
➤ 2 Seconds

Li 4S	0.3A	15.6V
DSC 000:	44	00058

BATT/PROGRAM Select

Press "STOP" and "-" to go through all the programs and press "START/ENTER" to enter LiPO BATT program.

Mode Select

Press "+" and "-" to go through all the modes (balance charge mode, memory mode, discharge mode and fast charge mode).

Battery Setting

Press START, the present value will start to blink. Press "+" and "-" to set the battery cells. And press START to confirm your setting. At the same time, Press START, the present value will start to blink. Press "+" and "-" to change the value and press START to confirm your setting.

Program Start

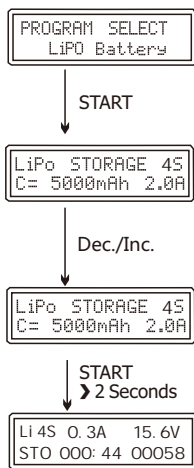
Press and hold START for 2 seconds to start the program.

Discharging Status

It shows the real-time data during discharging.

Storage Program

“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.



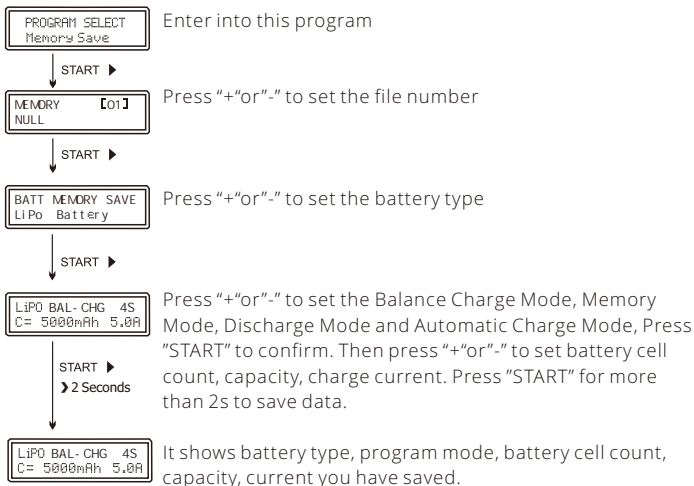
For different battery type, the end voltage are different, LiPo:3.85V, LiHV:3.85V, LiFe:3.3V, Lilon:3.75V. This is a intelligent program, it detects the battery voltage and automatically charge or discharge the battery. make sure to connect the battery to balance port when use this program.

OPERATION PROGRAM

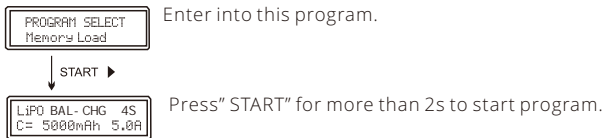
Battery Memory

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.

Battery Memory Set



Battery Memory Recall



Battery Meter

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

Voltage Meter

PROGRAM SELECT
Battery Meter

↓ START ▶

1: 4.17 4.18 4.17
4: 4.18 4.18 4.17

It can check the cell voltage of battery pack.

↓ Dec./Inc. ▶

OUTPUT: 20.00V
INPUT : 17.05V

It can check the output voltage and input voltage.

I.R. Meter

PROGRAM SELECT
Battery IR

↓ START ▶

MAIN OUT: *.* MΩ

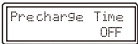



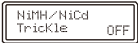
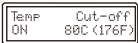
Check the inner resistance, for user's reference to check the battery quality.

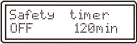


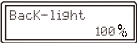


System Setting

The charger will operate with default values for the essential user settings when it is powered on for the first time. The screen displays the following system settings in sequence and the user can change the parameter value on each screen.

When you want to change the parameter value, press START/ENTER to make it blink, then change the value with INC or DEC. Then value will be stored by pressing START/ENTER once.

PROGRAM SELECT
User set =>

Item	Select	Description
	OFF/ON (1-10 Min)	Precharge Program Attention: Please OFF this program when under the normally charge mode.
	(1-60 Min)	This is for cycle mode, set the wait time between each charge or discharge process.
 	Default: 6-20mV/Cell 5-20mV/Cell	This setting is for NiMH/NiCd battery only. When the charger detects that the delta peak value you set has been reached, the charger will say the battery is fully charged.
	AUTO/OFF (50-200 mAh)	Trickle function is for full power maintenance on battery packs after fully charged.
	OFF/ON (30°C/86°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.

Item	Select	Description
	OFF/ON (10-720 Min)	When you start a charge process, the internal safety timer automatically starts running at the same time. It is programmed to prevent overcharging. If the battery proves to be faulty or if the termination circuit cannot detect the full battery. The value of the safety timer should be generous enough to allow full charging of the battery.
	(100-99900 mAh)	This sets the maximum charge capacity that will be supplied to the battery during charge. If the delta peak voltage is not detected for any reason or the safety timer has not expired, this feature will automatically stop the process at the selected capacity value.
	OFF/ON	Key Beep sounds every time you press a button. Buzzer beep or melody sounds at various instances during operation to alert certain process events.
	OFF 10%-100%	Adjust the LCD backlight
	3.80V/C-4.10V/C	Set the cut-off voltage of LiPo, Lilon, LiFe, LiHV, Pb batteries.
		Press START for more than 2s for factory reset.

Error Message

- | | | |
|----------------------------------|---|---|
| REVERSE POLARITY | ⇒ | Incorrect polarity connected. |
| CONNECTION BREAK | ⇒ | Charger and battery connection is wrong. |
| SHORT ERROR | ⇒ | Input short circuit |
| INPUT VOL ERR | ⇒ | Input voltage less than required value |
| BATTERY CHECK
LOW VOLTAGE | ⇒ | Battery total voltage is lower than setting value,
please check the cell count. |
| BATTERY CHECK
HIGH VOLTAGE | ⇒ | Battery total voltage is higher than setting value,
please check the cell count. |
| BATTERY VOLTAGE
CELL LOW VOL | ⇒ | Voltage of one cell in the battery pack is too low. |
| BATTERY VOLTAGE
CELL HIGH VOL | ⇒ | Voltage of one cell in the battery pack is too high. |
| BATTERY VOL ERR
CELL CONNECT | ⇒ | The battery balance connection is wrong.
Please check the connector and cable. |
| TEMP OVER ERR | ⇒ | Temperature too high, please check the temperature
sensor and take cooling measures. |

COMPLIANCE INFORMATION FOR THE EUROPEAN UNION

European Compliance Information
Declaration of Conformity



Product(s):
Item Numer(s):

Battery balance charger
C1-XR

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

The logo for EV-PEAK, featuring the text "EV-PEAK" in a bold, italicized, sans-serif font. The "E" and "P" are connected, and there is a stylized lightning bolt or spark symbol integrated into the "V".

SHENZHEN EV-PEAK NEW ENERGY TECHNOLOGY CO.,LTD
www.ev-peak.cn

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