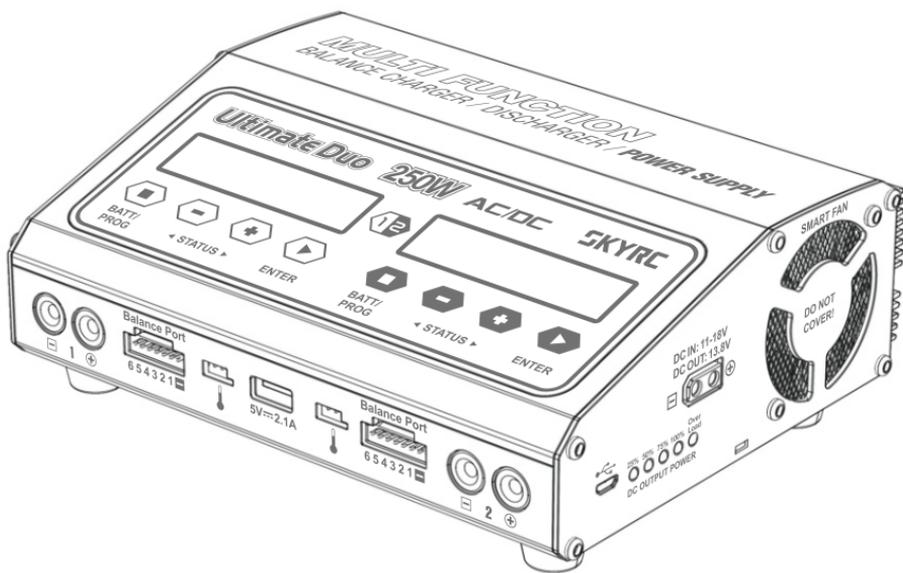# Ultimate Duo 250W AC/DC

BALANCE CHARGER / DISCHARGER / **POWER SUPPLY**

Instruction Manual
[Version 1.0]

SKYRC

Table of Contents

WARNING:

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.

Do not recharge non-rechargeable batteries!

Thanks for your choice of SKYRC Ultimate Duo 250W AC/DC Balance Charger / Discharger / Power Supply. This unit is simple to use, but the operation of a sophisticated automatic charger such as SKYRC D250 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. We hope you have many years of pleasure and success with your new battery charger.

SKYRC D250 is a high-performance, micro processor control charge/ discharge station with battery management suitable for use with all current battery types, with integral equalizer six-cell Lithium-Polymer (LiPo), Lithium iron phosphate (LiFe) and Lithium-Ion (LiIon) batteries; maximum 10A charge current.

The additional LiHV mode is able to charge the new generation of LiPo batteries with an end of charge voltage 4.35V. There are Automatic Charging Current Limit, Capacity Limit, Temperature Threshold and Processing Time Limit which makes the charger safe to use.

D250 is a twin-channel charger with two independent circuits which can charge two different kinds of batteries simultaneously. It also supports power distribution in AC mode to get max charging power to shorten charging time, the synchronization mode is available, in which users could perform synchronous settings for charging same batteries simultaneously to offer time-saving benefits. Besides that, voice guide is available, which will allow users to enjoy more fun during the using.

Your Ultimate Duo 250W can supply maximum 150 Watts DC power. You can use it to power equipments that require DC power. It converts standard household power 100-240V AC to 13.8V DC power.

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 mis-handle batteries and battery chargers, as there is always a risk of batteries catching fire and exploding.

Introduction

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!

LCD Display

Power Switch

AC Socket 100-240V

Output Socket 4mm Banana Plug

Balance Lead Socket

Temperature Sensor Port

USB Port

Temperature Sensor Port

Balance Lead Socket

Output Socket 4mm Banana Plug

Resume or Start Charge Processes

Alter Values
See the Status of Individual Cells in Balance Charge Mode

Scroll Through the Main Menu Stop Any Charge Processes

Cooling Fan

DC Input 11-18V DC Output 13.8V

DC Output Power Level Indicator

Micro USB Port for PC Link

THE SET CONTAINS

1. SKYRC Ultimate Duo 250W
2. XH Adaptor X 2
3. Charging Cable X 2
4. Banana connectors with XT60 connector Charging Cable X 2
5. Power Cord
6. DC Input/Output Cable
7. Power Distribution
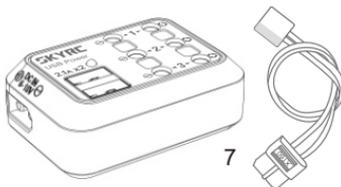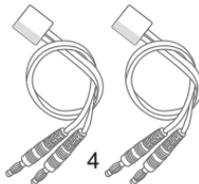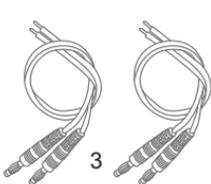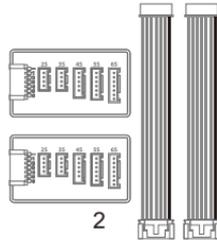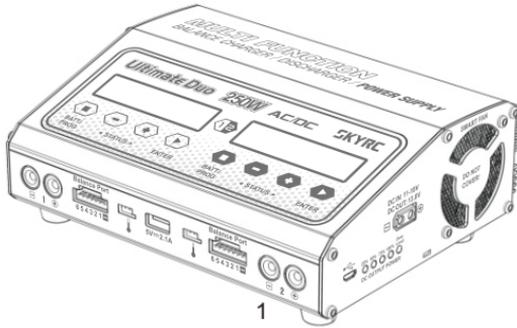
Special Features

Twin-channel Charger

SKYRC D250 allows you to plug 2 batteries into one charger simultaneously, and it will intelligently and automatically charge 2 battries at once to their maximum capacity. To top of it, the batteries being charged do not even need to have the same configuration. You can connect different chemistry(NiMH/NiCd/LiPo/LiFe/LiIon/LiHV/Pb)batteries into any of the charging ports.
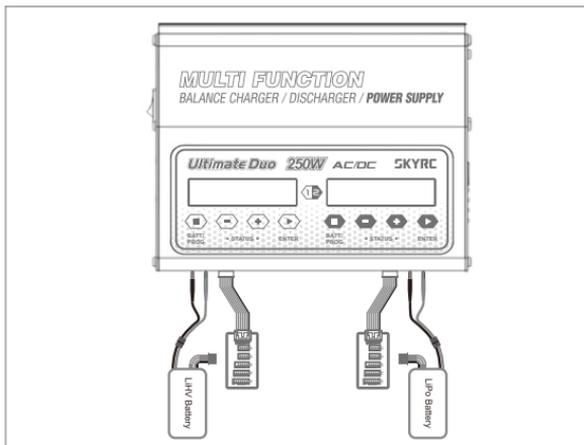
DC Power Output and Power Distribution

Besides charging batteries, your Ultimate Duo 250W can supply 150 Watts DC Power. You can use it to power equipments that require DC power. It converts standard household power 100-240V AC to 13.8V DC power.

Power distribution is supported. For example, if you set output power for Channel 1 to 50W and Channel 2 to 100W, DC power output will be 100W automatically, total power is 250W.

Optimized Operating Software

SKYRC D250 features the so-called AUTO function that set 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 minimize the 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 each channel. 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 expert user only)

Internal Independent Lithium Battery Balancer

SKYRC D250 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, SKYRC D250 can monitor and balance each cell of the battery individually. 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

SKYRC D250 is adaptable to various types of lithium batteries, such as LiPo, LiIon and the new LiFe series of batteries.

LiHV Mode Available

The additional LiHV mode is able to charge the new generation of LiPo batteries with an end of charge voltage 4.35 V.

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.

Special Features

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 Voltage 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 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.

❗ 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 11~18V DC, and charge power 250W for 2 channels.

❗ The allowable AC input voltage is 100~240V AC, and charge power 250W for 2 channels and power supply.

❗ This charger and the battery should be put on a heat-resistant, noninflammable 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.

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	3.0-3.3V/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.

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).
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 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.

Program Flow Chart

Note: The flow chart is taking one channel for example as the flow chart for the two channels (Channel 1 and Channel 2) are identical.

BATT/PROGRAM LiPo BATT	LiPo BALANCE 2.0A 7.4V (2S)	LiPo CHARGE 2.0A 7.4V (2S)	LiPo FAST CHG 2.0A 7.4V (2S)	LiPo STORAGE 2.0A 7.4V (2S)	LiPo DISCHARGE 2.0A 7.4V (2S)
BATT/PROGRAM LiFe BATT	LiFe BALANCE 2.0A 6.6V (2S)	LiFe CHARGE 2.0A 6.6V (2S)	LiFe FAST CHG 2.0A 6.6V (2S)	LiFe STORAGE 2.0A 6.6V (2S)	LiFe DISCHARGE 2.0A 6.6V (2S)
BATT/PROGRAM Lilo BATT	Lilo BALANCE 2.0A 7.2V (2S)	Lilo CHARGE 2.0A 7.2V (2S)	Lilo FAST CHG 2.0A 7.2V (2S)	Lilo STORAGE 2.0A 7.2V (2S)	Lilo DISCHARGE 2.0A 7.2V (2S)
BATT/PROGRAM LiHV BATT	LiHV BALANCE 2.0A 7.6V (2S)	LiHV CHARGE 2.0A 7.6V (2S)	LiHV FAST CHG 2.0A 7.6V (2S)	LiHV STORAGE 2.0A 7.6V (2S)	LiHV DISCHARGE 2.0A 7.6V (2S)
BATT/PROGRAM NiMH BATT	NiMH CHARGE CURRENT 2.0A	NiMH Auto CHARGE CURRENT 2.0A	NiMH DISCHARGE 0.1A CUT: 1.0V	NiMH RE-PEAK 1	NiMH CYCLE CHG>DCHG 1
BATT/PROGRAM NiCd BATT	NiCd CHARGE CURRENT 2.0A	NiCd Auto CHARGE CURRENT 2.0A	NiCd DISCHARGE 0.1A CUT: 1.0V	NiCd RE-PEAK 1	NiCd CYCLE CHG>DCHG 1
BATT/PROGRAM Pb BATT	Pb CHARGE 2.0A 2.0V (1P)	Pb DISCHARGE 0.1A 2.0V (1P)			
BATT/PROGRAM BATT METER	3.99 4.00 3.99 V 0.00 0.00 0.00 V	MAIN 11.98V H4.003V L3.986V			
BATT/PROGRAM BATT RESISTANCE	5 3 3 mΩ 0 0 0 mΩ	TATAL: 11mΩ			

BATT/PROGRAM SYSTEM SETTING->	CH1: 100 CH2: 100W DC SUPPLY: 50W	Safety Timer ON 120Min	Capacity Cut-Off ON 5000mAH	Temp Cut-Off ON 50°C 122°F	Temperature Unit Celsius	Rest Time CHG>DCHG 10Min
	Load Factory Set Enter	Synchronization OFF	DC Input Low CUT-OFF 11.0V	Key Beep ON Buzzer ON	NiCd Sensitivity D.Peak Default	NiMH Sensitivity D.Peak Default
	Version HW:1.00 SW: 1.10					

BATT/PROGRAM BATT MEMORY	[BATT MEMORY 1] ENTER SET->	BATT TYPE LiPo	BATT VOLTAGE 7.4V (2S)	CHARGE CURRENT 4.9A	DISCH CURRENT 2.2A	DISCHG VOLTAGE 3.0V/CELL
	ENTER-3 Seconds	[BATT MEMORY 1] C:4.9A D:2.2A	[BATT MEMORY 1] LiPo 7.4V (2S)	SAVE PROGRAM SAVE....	SAVE PROGRAM ENTER	TVC=YOUR RISK 4.20V
	ENTER CHARGER LOAD......	LiPo BALANCE CHG 4.9A 7.4V(2S)	LiPo CHARGE 4.9A 7.4V(2S)	LiPo FAST CHARGE 4.9A 7.4V(2S)	LiPo STORAGE 4.9A 7.4V(2S)	LiPo DISCHARGE 2.2A 7.4V(2S)
	[BATT MEMORY 2] ENTER SET->	BATT TYPE NiMH	BATT VOLTAGE 2.4V (2S)	CHARGE CURRENT 3.3A	TRICKLE 100mA	PEAK DELAY 1Min
	[BATT MEMORY 2] C:1.0A D:1.0A	[BATT MEMORY 2] NiMH 2.4V (2S)	SAVE PROGRAM SAVE....	SAVE PROGRAM ENTER	DISCHG VOLTAGE 1.1V/CELL	DISCHG CURRENT 2.2A
	ENTER CHARGER LOAD......	NiMH CHARGE CURRENT 1.0A	NiMH Auto CHARGE CURRENT 1.2A	NiMH DISCHARGE 1.0A CUT: 2.0V	NiMH RE-PEAK 2	NiMH CYCLE DCHG>CHG 1
	[BATT MEMORY 3] ENTER SET->	BATT TYPE Pb	BATT VOLTAGE 4.0V (2P)	CHARGE CURRENT 3.3A	DSCH CURRENT 1.5A	DSCH VOLTAGE 1.7V/CELL
	Pb CHARGE 3.3A 4.0V(2P)	ENTER CHARGER LOAD......	[BATT MEMORY 3] C:3.3A D:1.5A	[BATT MEMORY 3] Pb 4.0V (2S)	SAVE PROGRAM SAVE....	SAVE PROGRAM ENTER
	Pb DISCHARGE 1.5A 4.0V(2P)					

ENTER-3 Seconds

ENTER > 3s

ENTER-3s

Stop Batt/ Type

BATT PROG / STOP Button:
It is used to stop the progress or go back to previous step/screen
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
ENTER / START Button:
It is used to enter parameter or store parameter on screen, resume or start charge processes.

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

When you power on the charger, it will enter 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.
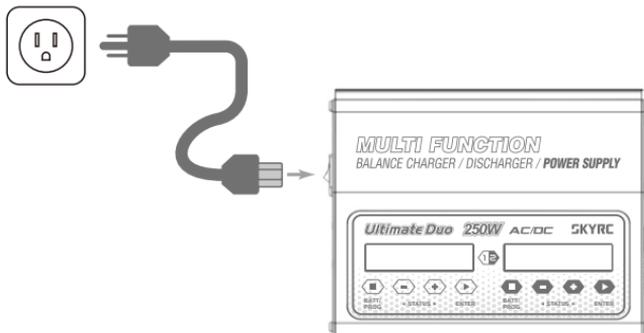
If you have no request for LiPo Battery program, please press the BATT PROG/STOP button to enter BATT PROGRAM screen.
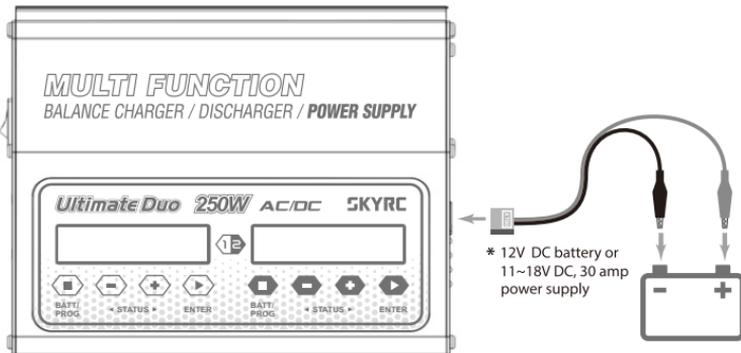
Power and Battery Connection

1. **Connecting to power source**

    There are two kinds of inputs for SKYRC D250, DC 11-18V and AC 100-240V.

    AC 100-240V power source connection.

    12V DC Battery / DC power supply connection.

   * 12V DC battery or 11~18V DC, 30 amp power supply

Power and Battery Connection

Note: We will explain the operating procedure of one channel as the procedure for channel 1 and 2 is identical.

2. Connecting the battery

⚠️ **WARNING!** **TO AVOID SHORT CIRCUITS, ALWAYS CONNECT THE CHARGE LEADS TO THE CHARGER FIRST, AND THEN TO THE BATTERY. REVERSE THE SEQUENCE WHEN DISCONNECTING THE PACK.**

1) LiPo Battery Connection with Balance Adapter
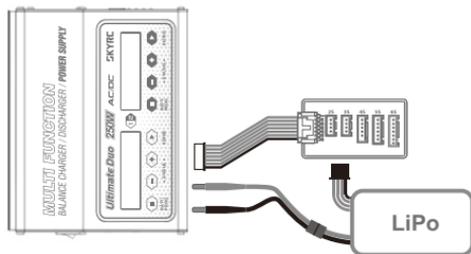
Balance Socket

For safety reasons, the default setting for charging Lithium (LiPo, Lilo, LiFe and LiHV) battery is using balance adaptor to connect battery and charger in Charge, Fast Charge, Balance Charge and Storage modes. But if the battery comes with no balance wire, it will prompt you "No balance cable detected push enter to continue" in Charge, Fast Charge and Storage modes.

The balance wire attached to the battery must be connected to the charger with the black wire aligned with the negative marking. Ensure correct polarity!

2) NiMH/NiCd or Pb Battery Connection
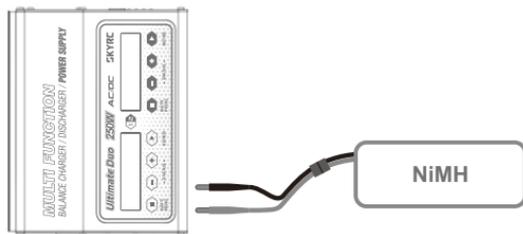
Operating Program

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

Note: We will explain one channel as the operating procedure of Channel 1 and Channel 2 is identical.

1. **Connection**

    1). **Connecting to power source**

    There are two kinds of inputs for SKYRC D250, DC 11-18V and AC 100-240V.

    A. Operating in AC mode

    SKYRC D250 comes with built in switching power supply. You can connect the AC power cord directly to the main AC socket. (100-240V AC).

    Note: The charging power in AC mode is 250W totally for Channel 1, Channel 2 and Power supply.

    In AC mode, it supports Power Distribution. The total power for Channel 1, Channel 2 and power supply is 250W. You could set the Max Power for one channel (Take Channel 1 for example)as following,

    ```
    CH1:120  CH2:50W
    DC SUPPLY:    80W
    ```
    <1 2>
    ```
    CH1:120  CH2:50W
    DC SUPPLY:    80W
    ```

    And the DC power supply will take the rest power automatically (For example, if you set channel 1 as 120W and channel 2 as 50W,the power supply will be 80W).

    NOTE1: If Channel 1 and Channel 2 are both charging, you can't change the power distribution.

    NOTE2: If Channel 1 is charging, you can change power of Channel 2 and Channel 1, the power supply will take the rest power automatically.

    B. Operating in DC mode

    Please connect SKYRC D250 with AC/DC power supply by supplied DC input cable. Also you could use terminal clips with DC connectors, for attaching directly to 12V car batteries. It is critically important that you use either a fully charged 13.8V car battery or a high quality AC/DC power supply in the range of 11-18V DC output with minimum power 300W or higher to insure reliable performance.
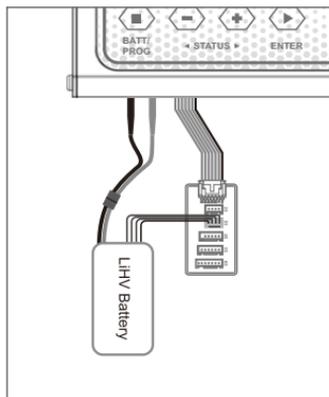
2). **Connecting the battery**

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 a MUST for charging Lithium (LiPo, Lilo, LiFe and LiHV) battery in Balance Charge mode. If you don't connect the battery to the balance socket while the charger is working in mentioned mode, the charger won't start working.

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! (See the wiring diagram below.)
This diagram shows the correct way to connect your battery to the SKYRC D250 while 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.

Lithium Battery Program *(LiPo/LiFe/LiIon/LiHV)*

The following flowcharts show the entire programming menu. It is highly recommended to keep these flowcharts handy while you learn how to operate this charger.
There are two main ways to program the charger.

(1) A memory profile is available for setting and storing pertinent information for up to 40 different program sets; each channel can store 10 sets. Once a battery program is stored into memory, it will be retained until changed again manually. Recalling a program memory number makes the charger instantly ready to go!

(2) If you do not wish to use the battery program memories, this charger can be manually set before each use.

The following flowchart shows how the program is set manually:

```
BATT/PROGRAM
  LiPo BATT
```
| START/ENTER
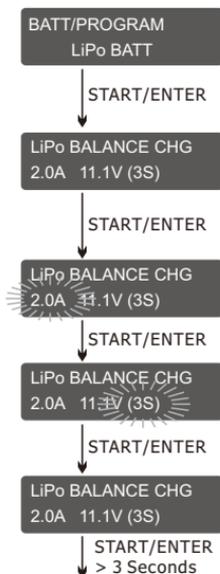
BATT/PROGRAM Select

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

```
LiPo BALANCE CHG
2.0A  11.1V (3S)
```
| START/ENTER

Mode Select

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

```
LiPo BALANCE CHG
2.0A  11.1V (3S)
```
| START/ENTER

Battery Setting

Press START/ENTER, the present value will start to blink. Press INC and DEC to change the value and press START/ENTER to confirm your setting.

```
LiPo BALANCE CHG
2.0A  11.1V (3S)
```
| START/ENTER

At the same time, the battery pack's cell count will start to blink, press INC and DEC to change the value and press START/ENTER to confirm your setting.

```
LiPo BALANCE CHG
2.0A  11.1V (3S)
```
| START/ENTER
| > 3 Seconds

Program Start

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

Lithium Battery Program *(LiPo/LiFe/LiIon/LiHV)*

BATTERY CHECK
WAIT...

The charger is detecting the battery cell.

R:3SER S:3SER
CANCEL(STOP)

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

R:3SER S:3SER
CONFIRM(ENTER)

↓ START/ENTER

R shows the number of cells detected by the charger and S is the number of cells set by you on the previous screen. If the two numbers are identical, press START/ENTER to start the charging process.

Lp3s 1.5A 12.14V
BAL 000:50 00022

Charging Status Monitor
During charge process, real-time status will be shown as seen on the left.
NOTE: The battery icon indicates the charge/discharge status and finished capacity percentage.
Green—charge   Red—discharge

[END: FINISHED]
16.8V 2600mAh

Program Complete

Once the battery is fully charged, the screen will read "END: FINISHED" and the charger will emit a ringing sound. The charger also displays battery voltage, charging capacity and elapsed time.

[Time: 00: 45: 32]
16.8V 2600mAh

Program Stop
During the charging process, press STOP to stop the charging process.
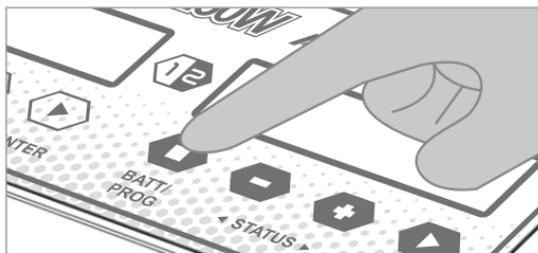
Lithium Battery Program *(LiPo/LiFe/LiIon/LiHV)*

VARIOUS INFORMATION DURING THE PROCESS

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

Lp3s 1.5A 12.14V
BAL 000:50 00022

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

↕ INC ▶

4.07 4.06 4.11 V
0.00 0.00 0.00 V

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

▶ ↕ INC

Fuel= 90%
Cell= 4.10V

Charged capacity percentage and average cell voltage of the battery pack.

- -

Lp3s 1.5A 12.14V
BAL 000:50 00022

◀ ↕ DEC

End Voltage
12.6V(3S)

Final voltage when the program ends.

◀ ↕ DEC

IN Power Voltage
12.56V

Input voltage.

◀ ↕ DEC

Ext. Temp   ----
Int. Temp   37°C

Internal temperature.
Temperature probe needs to be connected to show external temperature.

◀ ↕ DEC

Temp Cut-Off
50C

Cut off temperature.

◀ ↕ DEC

Safety Time
ON   200min

Safety timer ON and duration of time in minutes.

◀ ↕ DEC

Capacity Cut-Off
ON   5000mAh

Capacity cut-off ON and value of the set capacity limit.

NiMH/NiCd:

This program is only suitable for charging/discharging NiMH/NiCd batteries. The D250 offers the following NiMH/NiCd charge modes: Charge, Auto Charge, Discharge, Re-Peak and Cycle.

Selecting the Battery Type:

After powering on the D250, press the INC or DEC button repeatedly until you reach the appropriate program for the battery type you wish to charge. For this example we have chosen the "NiMH BATT" or "NiCd BATT" program. Now press the ENTER button to enter the desired program.

⚠️ **WARNING!** **BEFORE YOU BEGIN CHARGING YOUR BATTERY, MAKE SURE YOU ARE CHARGING NIMH/NICD BATTERIES. CHARGING LIPO BATTERY UNDER NIMH/ NICD BATTERY PROGRAM WILL CAUSE FIRE.**

NiMH/NiCd Charge Mode:

BEFORE YOU BEGIN CHARGING YOUR BATTERY, MAKE SURE YOU HAVE READ AND UNDERSTOOD ALL OF THE WARNINGS AND SAFETY INFORMATION CONTAINED ON PAGES 06-08.

After selecting the correct battery type, if the screen does not read "CHARGE", use the DEC or INC buttons to change it to the "CHARGE" mode.

```
NiMH CHARGE
CURRENT   2.0A
```

START/ENTER

```
NiMH 2.0A  5.42V
CHG 002:22 00106
```

Press the ENTER button and the amp rate value will begin blinking. Use the DEC or INC button to adjust the value to the desired rate. Follow the instructions provided on your battery when setting the charge current.
Press and hold the ENTER button for 3 seconds to start charging.

Once charging has commenced, the charger will display the following real-time information: battery type, charging current, battery voltage, charging time and charged capacity. Once the battery is fully charged, the screen will read "END: FINISHED" and the charger will emit a ringing sound. You can press the STOP button at any time during the charging process to stop charging.

NiMH/NiCd Auto Charge Mode:

In this mode, the charger automatically detects the connected NiMH or NiCD battery and determines the proper full charge and cut-off thresholds. Setting the upper charge current limit for safe levels based on your battery specifications will ensure safe charging of your specific battery. If you are unsure of the maximum allowable charge rates, set the charger to a maximum of 1C (battery mAh/1000, e.g. 3200mAh = 3.2A).

NiMH/NiCd Battery Program

NiMH Auto CHARGE
CURRENT 1.3A

After selecting the correct battery type, use the INC or DEC button to change the charge mode to the "Auto CHARGE" setting.

Press the START button and the amp rate value will begin flashing. Use the INC or DEC button to adjust the value to the desired rate. Follow the instructions provided on your battery when setting the upper charge amperage rate.

START/ENTER

Press and hold the START button for 3 seconds to start charging.

NiMH 1.3A 5.42V
AUT 002:22 00106

Once charging has commenced, the charger will display the following real-time information: battery type, charging current, battery voltage, charging time and charged capacity.

Once the battery is fully charged, the screen will read "END: FINISHED" and the charger will emit a ringing sound. You can press the STOP button at any time during the charging process to stop charging.

NiMH/NiCd Discharge Mode:

NiMH DISCHARGE
1.3A CUT:9.6V

After selecting the correct battery type, use the INC or DEC button to select the "DISCHARGE" mode. Press the START button and the amp rate value will begin flashing. Use the INC or DEC buttons to adjust the value to the desired discharge rate. Press the START button again and the voltage cut-off will begin to flash. Use the INC or DEC button to adjust the value to the desired rate.

Follow the instructions provided on your battery when setting the voltage cut-off. The D250 will stop discharging when the battery has reached the preset voltage cut-off.

NiMH 1.3A 10.42V
AUT 002:22 00106

Press and hold the START button for 3 seconds to start discharging. Once discharging has commenced, the charger will display the following real-time information: battery type, discharging current, battery voltage, discharging time and discharged capacity.

NiMH/NiCd Battery Program

[TIME: 00:04:04]
9.6V 00640mAh

When discharging is complete, the screen will read "END: CUTOFF-VOL" and the charger will emit a ringing sound.

The charger will display the elapsed time, end voltage and the discharged capacity in mAh.

You can press the STOP button at any time during the discharging process to stop the discharge process.

NiMH/NiCd Re-Peak Mode:

Applicable to NiMH and NiCD batteries only, in re-peak mode the charger can peak-charge the battery once, twice, or three times in a row automatically. This process is good for confirming that the battery is fully charged and for verifying how well the battery can accept a fast charge. A five-minute cool-down delay occurs after each re-peak charge.

IN RE-PEAK MODE, THE D250 USES THE CHARGE AMPERAGE AND VOLTAGE SETTINGS ENTERED IN CHARGE MODE.

NiMH RE-PEAK
2

START/ENTER

NiMH 1.3A 10.42V
RPC 004:04 00686

After selecting the correct battery type, use the INC or DEC button to select the "RE-PEAK" mode. Press the START button and the Re-peak cycle number 1 begins to flash on the screen. Use the INC or DEC button to scroll through the cycle count and set a number between 1 and 3.

Press and hold the START button for 3 seconds to start the re-peak process.

Once the Re-Peak process has begun, the charger will display the following real-time information: battery type, charging current, battery voltage, elapsed time and charged capacity.

Once the Re-Peak process has completed, the screen will read "END: RE-PEAK" and the charger will emit a ringing sound. The D250 will display the charge/discharge capacity for each cycle. Using the + and - buttons, you can scroll through the history data of each cycle.

NiMH/NiCd Battery Program

NiMH/NiCd Cycle Mode:

The D250 makes cycling of NiMH/NiCd batteries easy. The process of discharging and recharging (cycling) can be performed automatically with one simple step and will improve the performance of NiMH/NiCd batteries. We strongly recommend cycling any battery that has been discharged and stored for a period of time. This will increase the remaining usable battery life and also improve the battery performance.

```
NiMH CYCLE
DCHG > CHG 2
```

START/ENTER
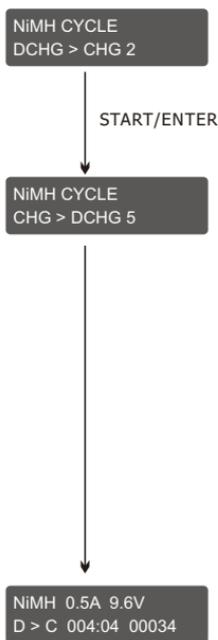
After selecting the correct battery type, use the INC or DEC button to select the "CYCLE" mode. The Cycle Mode gives you two cycling options: "DCHG>CHG" or "CHG>DCHG". The "DCHG>CHG" option will first discharge the battery and then recharge the battery.

```
NiMH CYCLE
CHG > DCHG 5
```

The "CHG>DCHG" option will first charge the battery and then discharge the battery. If this screen does not show your desired cycling option, press the START button once and this setting will begin flashing. Use the INC or DEC button to change this setting.

Pressing the START button again will cause the cycle count to begin flashing. Use the INC or DEC button to change this to the number of cycles you want the D250 to run. The D250 can cycle the battery a maximum of 5 times consecutively.
Press and hold the START button for 3 seconds to start the Cycle Mode.

```
NiMH  0.5A  9.6V
D > C  004:04  00034
```

Once cycling has commenced, the charger will display the following real-time information: battery type, charging/discharging current, battery voltage, elapsed time and charged/discharged capacity. You will also see "D>C" or "C>D". This will indicate which cycling order you have chosen. Either "D" or "C" will be flashing. This flashing indicates which part of the cycle is currently being executed.

Once the cycling process is complete, the screen will read "END: CYCLE" and the charger will emit a ringing sound. The D250 will display the charge/discharge capacity for each cycle. Using the + and - buttons, you can scroll through this data for each cycle.

Additional NiMH/NiCd Process Information:

During the NiMH/NiCd battery charging/discharging process the D250 can display a variety of information. Using the INC or DEC buttons, you can also view the following information:

NiMH Sensitivity D.Peak 4mV/CELL	Delta Peak Voltage Sensitivity setting	In Power Voltage 12.56V	Input Voltage
Ext. Temp ---- Int. Temp 37 C	External*/ internal temperature	Temp Cut-off 50 C	Temperature cut-off
Safety Time ON 200min	Safety timer setting	Capacity Cut-Off ON 5000mAh	Capacity limit setting

Pb Lead-Acid Battery Program

Pb (Lead-Acid):

BATT/PROGRAM
Pb BATT

This program is only suitable for charging Pb (lead-acid) batteries with nominal voltage ranging from 2 to 20V. Pb (lead-acid) batteries are significantly different from NiMH/NiCd batteries. Pb batteries can only deliver a low current in relation to their capacity. The same restriction applies to the charging process. Consequently, the optimum charge current can only be 1/10th of the capacity. A Pb battery cannot be used for fast charging. Please follow the instructions provided by the battery manufacturer.

The D250 offers the following Pb charge modes: Charge and Discharge.

Pb Charge Mode:

After selecting the correct battery type, use the INC or DEC button to change it to the "CHARGE" mode.

Press the START button and the amp rate value will begin flashing. Use the INC or DEC buttons to adjust the value to the desired charge rate. The amp rate should be set to 1/10th of capacity. For example, if you are charging a 20Ah battery the charge rate should be set to 2A. Follow the instructions provided on your battery when setting the amp rate.

Pb Lead-Acid Battery Program

Pb Charge
1.5A 12.0V(6P)

↓

P-6 1.5A 13.56V
CHG 002:22 00106

Press the START button again and the nominal battery pack voltage will begin flashing. Use the INC or DEC button to set the voltage and the number of cells.

Press and hold the START button for 3 seconds to start charging.

Once charging has commenced, the charger will display the following real-time information: battery type, charging current, battery voltage, charging time and charged capacity.

When charging is complete, the screen will read "FINISHED" and the charger will emit a ringing sound.

Pb Discharge Mode:

After selecting the correct battery type, use the INC or DEC buttons to change it to the "DISCHARGE" mode.

Press the START button and the amp rate value will begin flashing. Use the INC or DEC buttons to adjust the value to the desired discharge rate. Follow the instructions provided with your battery when setting the amp rate.

Pb Discharge
1.5A 12.0V(6P)

↓

P-6 1.0A 13.56V
DCH 005:10 00964

Press the START button again and the nominal battery pack voltage will begin flashing. Use the INC or DEC buttons to set the voltage and the number of cells.

Press and hold the START button and discharging will begin.

Once discharging has commenced, the charger will display the following real-time information: battery type, discharging current, battery voltage, discharging time and discharged capacity.

When discharging is complete, the screen will read "FINISHED" and the charger will emit a ringing sound.

Additional Pb Process Information:

During the Pb battery charging/discharging process the D250 can display a variety of information. Using the INC or DEC buttons you can also view the following information:

|			
Capacity Cut-Off ON 5000mAh	Capacity cut-off setting	Safety Time ON 200min	Safety timer setting
Temp Cut-off 50 C	Temperature cut-off	Ext. Temp ---- Int. Temp 37 C	External*/ internal temperature
In Power Voltage 12.56V	Input voltage		

· 24

DC Power Supply

Your Ultimate Duo 250W can supply 150 Watts DC Power. You can use it to power equipments that require DC power. It converts standard household power 100-240V AC to 13.8V DC power.
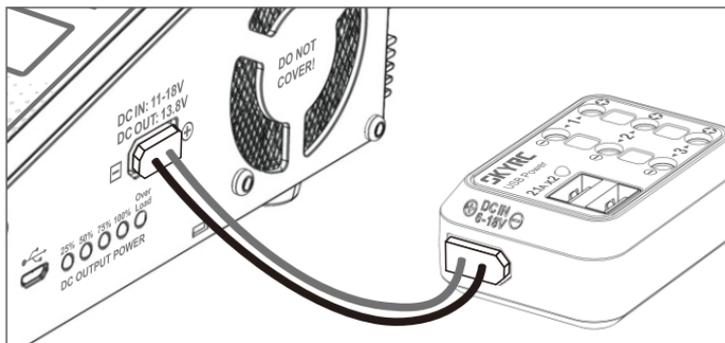
Operating Instruction

BATT/PROGRAM
SYSTEM SETTING->

Press the ENTER to enter the DC Power Supply program

↓ ENTER

CH1: 100 CH2: 100W
DC SUPPLY: 50W

Set the power of channel 1 and channel 2, the power supply will take the rest power automatically.

↓ ENTER

CH1: 50   CH2: 50W
DC SUPPLY: 150W

Caution: The maximum DC Power output is 150 Watts and the maximum current is 10A. Please check the total loading of your equipments before using DC power supply.

If the loading of DC power supply is over 150W, the led light will flash red.
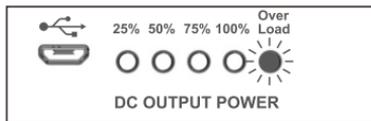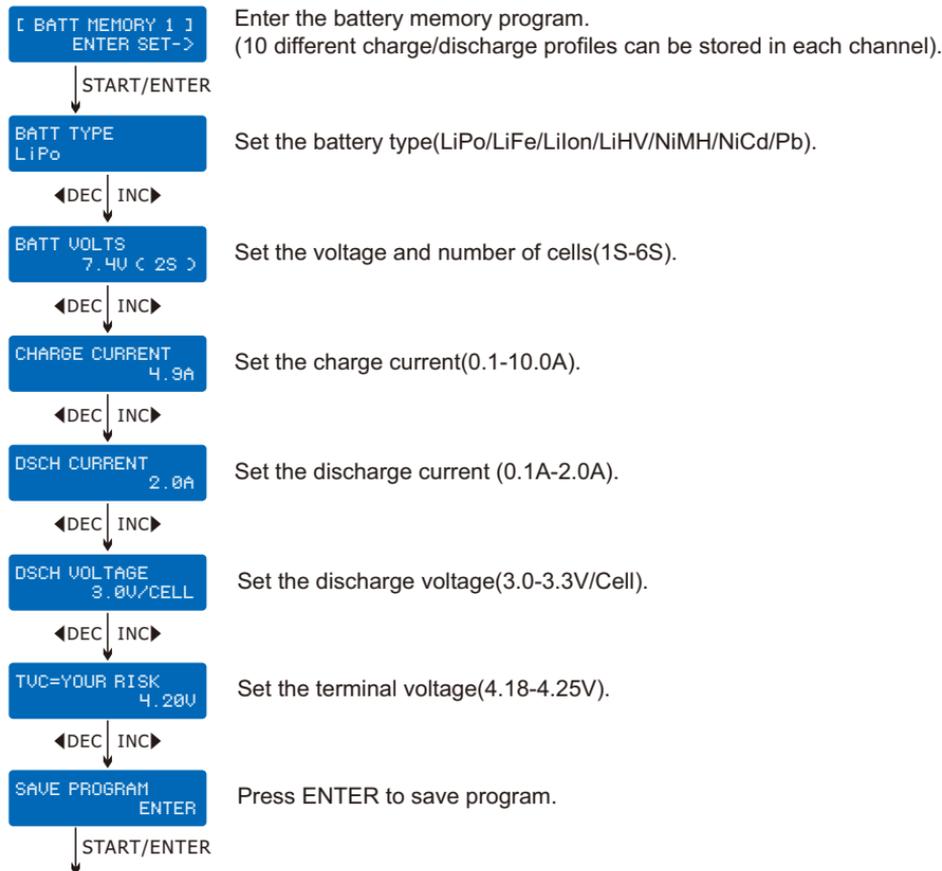
Battery Memory Set and Call Out

The charger can store up to 20 different charge/discharge profiles(each channel 10 sets) 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.

1. Battery Memory Set

```
[ BATT MEMORY 1 ]
    ENTER SET->
```
Enter the battery memory program.
(10 different charge/discharge profiles can be stored in each channel).

↓ START/ENTER

```
BATT TYPE
LiPo
```
Set the battery type(LiPo/LiFe/LiIon/LiHV/NiMH/NiCd/Pb).

◀DEC | INC▶

```
BATT VOLTS
    7.4V ( 2S )
```
Set the voltage and number of cells(1S-6S).

◀DEC | INC▶

```
CHARGE CURRENT
          4.9A
```
Set the charge current(0.1-10.0A).

◀DEC | INC▶

```
DSCH CURRENT
          2.0A
```
Set the discharge current (0.1A-2.0A).

◀DEC | INC▶

```
DSCH VOLTAGE
    3.0V/CELL
```
Set the discharge voltage(3.0-3.3V/Cell).

◀DEC | INC▶

```
TVC=YOUR RISK
        4.20V
```
Set the terminal voltage(4.18-4.25V).

◀DEC | INC▶

```
SAVE PROGRAM
        ENTER
```
Press ENTER to save program.

↓ START/ENTER

```
SAVE PROGRAM
SAVE .
```

↓

```
[ BATT MEMORY 1 ]
LiPo   7.4V (2S)
```
Indicate the battery type and battery cell of the saved profile.

↓

```
[ BATT MEMORY 1 ]
C:4.9A    D:2.2A
```
Indicate the charge and discharge current of the saved profile.
Press the START/ENTER for 3 seconds to call out the memory.

START/ENTER
>3 Seconds

↓

2. Battery Memory Call Out

```
ENTER CHARGER
LOAD
```
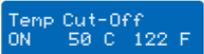Load the memory set

↓

```
LiPo BALANCE CHG
4.9A     7.4V(2S)
```
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 nor the safety timer expired by any reason, this feature will automatically stop the process at the selected capacity value.
Temp Cut-Off ON 50 C 122 F	OFF/ ON (20℃/68℉ - 80℃/176℉)	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>DCHG 10Min	1-60Min	A rest time allowing the battery to cool down between charging/discharging cycle.

ITEM	SELECTION	DESCRIPTION
NiMH Sensitivity D.Peak Default NiCd 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.
Key Beep ON Buzzer ON	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.
DC Input. Low Cut-Off 11.0V	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.
Synchronization OFF	OFF/ON	if you set it , channel 2 will synchronize the same operation as Channel 1.
Load Factory Set Enter		Press ENTER to load factory default setting.
Version HW:1.00 FW: 1.10		It indicates the hardware and firmware version.

Battery Voltage 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.
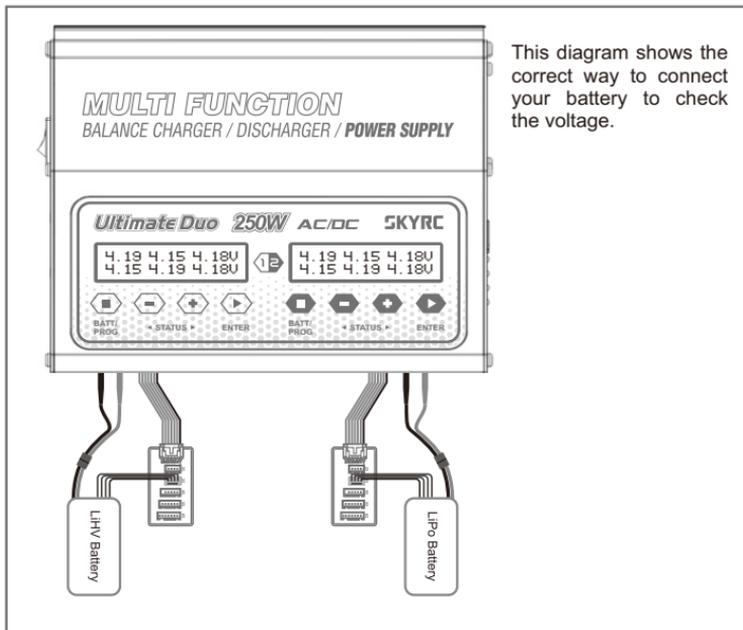
BATT/PROGRAM
    BATT METER

Press the START/ENTER to enter the Lithium Battery Meter program.

START
ENTER

4.20 4.19 4.19 V
4.18 4.18 4.19 V

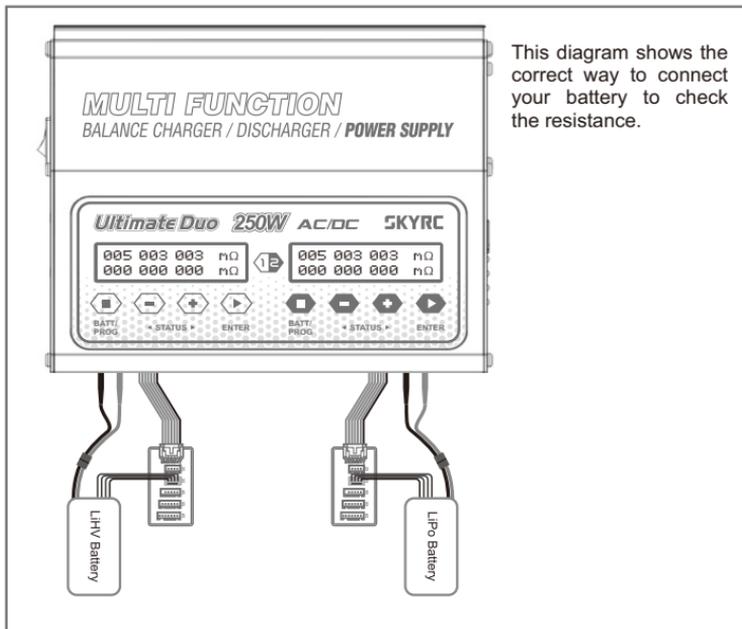The screen indicate each cell's voltage.

INC ↕ DEC

MAIN 25.13V
H4.200V L4.182V

The screen indicate 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

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

Start
Enter

012 005 005   mΩ
006   mΩ

The screen indicate each cell's resistance.

INC ↕ DEC

TATAL: 28mΩ
H: 12mΩ   L: 5mΩ

The screen indicate the total resistance, the highest resistance and the lowest resistance.

Warning and 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	The internal temperature of the unit goes too high.
EXT.TEMP.TOO HI	The external temperature of the battery goes too high.
OVER CHARGE CAPACITY LIMIT	The battery capacity is more than the maximum capacity which the user sets.
OVER TIME LIMIT	The charging time is longer than the maximum charging time which the user sets.
BATTERY WAS FULL	The battery voltage is higher than the maximum voltage which the user sets when charging in balance mode.

Specification

- DC Input Voltage : 11-18V
- AC Input Voltage: 100-240V
- Display Type: 2x16 LCD
- Display Backlight: Black
- Case Material: Metal
- Controls: Eight Buttons
- Case Size: 184x146x70mm
- Weight: 1293g
- DC Power Supply Output: 13.8V / Max. 150W
- PC Communications: USB Port for 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: 20ºC/68ºF-80ºC/176ºF(adjustable)
- Charge Voltage: NiMH/NiCd: Delta peak detection
  - LiPo: 4.18-4.25V/cell   LiIon: 4.08-4.2V/cell
  - LiFe: 3.58-3.7V/cell   LiHV: 4.25-4.35V/cell
- Balance Current: 300mA/cell
- Reading Voltage Range: 0.1-26.1V
- Battery Types/Cells: LiPo/LiIon/LiFe/LiHV: 1-6cells
  - NiMH/NiCd: 1-15cells
  - Pb: 2-20V
- Battery Capacity Range: NiMH/NiCd: 100-50000mAh
  - LiPo/LiIon/LiFe/LiHV: 100-50000mAh
  - Pb: 100-50000mAh
- Charge Current: (0.1A-10.0A) x2
- Safety Timer: 1-720minutes off
- Charge Wattage: Channel 1: 50-120W   Channel 2: 50-120W
  - Power Supply: 10-150W   CH1+CH2+PS=250W
- Discharge Current: (0.1A-2.0A) x2
- Discharge Cut-off Voltage: NiMH/NiCd: 0.1-1.1V/cell
  - LiPo: 3.0-3.3V/cell   LiIon: 2.9—3.2V/cell
  - LiFe: 2.6-2.9V/cell   LiHV: 3.1-3.4V/cell
  - Pb: 1.8V
- Discharge Wattage: 10Wx2
- Balance Cells: 2-6 cells
- Language of Voice: English
- Memory: 10x2 Different Charge/Discharge Profiles
- Charge Method: CC/CV for Lithium Types and Lead (Pb) Batteries
  - Delta-peak Sensitivity for NiMH/NiCd.

Conformity Declaration

This appliance can be used by children aged from 14 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

⚠ Never leave the charger unattended when it is connected to its power socket. If any malfunction is found, TERMINATE THE PROCESS AT ONCE.

⚠ Keep the charger well away from dust, damp, rain, heat, direct sunshine and vibration. Never drop it.

⚠ Never charge batteries on wood, cloth, carpet or on any other flammable material.

⚠ During charging, the charger must be placed in a well ventilated area.

⚠ The allowable AC input voltage is 100~240V AC.

This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustain able reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

The D250 Charger satisfy all relevant and mandatory CE directives and FCC Part 15 Subpart B: 2016.

For CE directives:
The product has been tested to meet the following technical standards:

Test Standards	Title	Result
EN55014-1:2006+ A1:2009+A2:2011	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission	Conform
EN55014-2: 2015	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard	Conform
EN 61000-3-2:2014	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current <= 16 A per phase)	Conform
EN 61000-3-3:2013	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection	Conform
EN 60335-1: 2012 +A11: 2014	Household and similar electrical appliances - Safety - Part 1: General requirements	Conform
EN 60335-2-29: 2004+A2: 2010	Household and similar electrical appliances - Safety - Part 2: Particular requirements for battery chargers	Conform
EN 62233: 2008	Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure	Conform

This symbol means that you must dispose of electrical from the general household waste when it reaches the end of its useful life. Take your charger to your local waste collection point or recycling centre. This applies to all countries of the European Union, and to other European countries with a separate waste collection system.

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 polarized in this condition, and this can cause permanent damage.

A, mA: unit of measurement relating to charge or discharge current.1000 mA = 1 A (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 2 A, it has been fed 2 Ah of energy. It receives the same quantity of charge (2 Ah) if it is charged for 4 hours at 0.5 A, or 15 minutes (=1/4 h) at 8 A.

'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).
-.LiIo: multiply the total number of cells in the pack by 3.6. A 2-cell LiIo 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 LiIo wired in series will have a nominal voltage of 13.2 volts (4x3.3).
-.LiHV: multiply the total number of cells in the pack by 3.7V. A 4-cell LiHV wired in series will have a nominal voltage of 14.8 volts (4x3.7).
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 and Service

Liability exclusion

This charger is designed and approved exclusively for use with the types of battery stated in this Instruction Manual. SkyRC 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 SkyRC products which were immediately and directly involved in the event in which the damage occurred.

Warranty and service

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.

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.

Note:

1. The warranty service is valid in China only.

2. If you need warranty service overseas, please contact your dealer in the first instance, who is responsible for processing guarantee claims overseas. Due to high shipping cost, complicated custom clearance procedures to send back to China. Please understand SkyRC can't provide warranty service to overseas end user directly.

3. If you have any questions which are not mentioned in the manual, please feel free to send email to info@skyrc.cn

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Latest version can be downloaded from www.skyrc.com

If you have any question about this document, please contact
SkyRC by sending a message to info@skyrc.cn