



4010DUO User's Manual (V2.1)

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Use Notice

●Safety Notes

Please read the entire Manual completely before using, to make sure you can use this device better and more safely.

1. 4010DUO is a dual port charger, does not mean can charge/discharge for any configuration of the two sets of batteries! Must follow: two battery packs have not any external electrical connection, otherwise it will burn the charger or batteries. For example: charging 12S battery pack, must split into two separate 6S, and absolutely prohibit to charge with two 6S battery packs in series via connecting with CH-1, CH-2 respectively.
2. 4010DUO input power cannot have fast fluctuations, which may cause output over current, and will burn the charger or the batteries and input power in extreme cases. For example: setting the input protection current and voltage is necessary according to the specifications of the input supply, in order not to cause power overload. Some power overload protection will produce substantial fluctuations for the voltage.
3. Keep the charger away from children and pets at all times.
4. Never leave the charger unsupervised when charging or discharging. If you leave, disconnect the battery to prevent any unexpected dangers or damage.
5. Ensure the charger program and settings match the battery pack otherwise the battery will be damaged and a dangerous situation may arise, especially for Lithium batteries, which may cause a fire.
6. Do not mix batteries of different types, different capacities or from different manufacturers.
7. Do not disassemble the charger.
8. Do not place the charger or any battery on a flammable surface or near a combustible material while in use. Do not charge or discharge on a carpet, cluttered workbench, paper, plastic, vinyl, leather or wood, inside an R/C model or inside a full-sized automobile.
9. Never block the air intake holes and never use in a refrigerated or high temperature environment. If used in such an environment, the internal temperature protection may result in abnormal charging/discharging that could be dangerous.
10. Do not allow water, moisture, metal wires or other conductive material into the charger.
11. Never charge or discharge any battery having evidence of leaking, expansion/swelling, damaged outer cover or case, color-change or distortion.
12. Do not try to charge “non-rechargeable” dry cells.
13. Do not exceed the battery manufacturer’s suggested maximum charge rates.
14. Carefully follow the battery pack manufacturer’s recommendations and safety advice.

●Copyright

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● 4010DUO Special Features

1. The 4010DUO uses advanced Synchronous buck-boost DC/DC converter technology, high power, and high current and high-performance power conversion circuit. The maximum charge power capacity up to 2000W, the maximum charge/discharge current of channel up to 40A, and two channels in Synchronous Mode up to 70A.
2. Channel Supports 10s LiPo, Lilo, LiFe, with maximum 1.2A balance current, adopts unique balance calculation of internal resistance correction .
3. Intelligent fan control. Sensing internal temperature via the internal temperature sensor, to thereby control the fan speed.
4. Internal temperature protection. When the internal temperature exceeds the reduce temperature, the output power is automatically reduced; and the charger will shut down when temperature exceeds the cut-temperature.
5. 64 parameters sets can be saved, without repeat setting when use, just import/export via SD card.
6. TFT LCD screen that provides rich information including current, voltage, power, capacity, internal resistance, control status, time-consuming and temperature, etc.
7. Multi-discharge features: discharge-self, regenerative to input discharge, regenerative to channel discharge, and lithium battery extra expanding discharge.
8. Support measurement for internal resistance of battery offline and online. Can measure not only the internal resistance of the entire battery pack, but also measure the per-cell internal resistance of lithium battery.
9. The iCharger has protection for reversed polarity (input or output), input voltage/current, battery temperature, charging capacity, time overrun and maximum power etc.
10. Supports upgrading the hardware program by USB port. The iCharger also supports the “Logview” software and can display, plot and analyze the charge and discharge data by it. (See detail information about Logview in the following website: <http://www.logview.info>)

● Appearance Parameters:

- Net weight: 1.47kg
- Dimension: 210.0×140.1×80.2 ±0.5mm

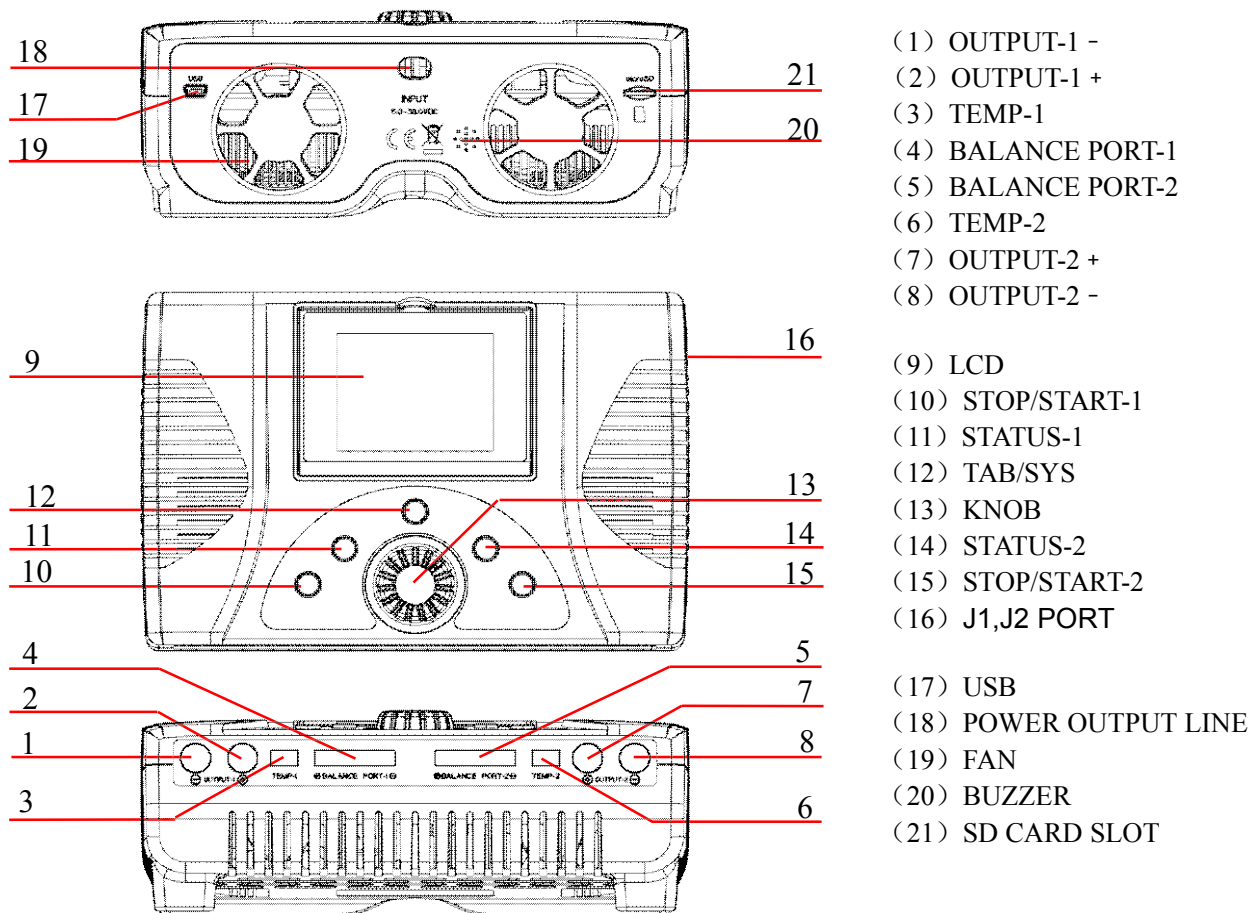
● Specifications:

- Input voltage range: 9.0—50.0VDC
- Maximum input current limit: <65A
- Maximum charge/discharge current: 70A@Syn. Mode 40A@Asyn. Mode
- Maximum charge power capacity: 2000W (Channel 1400W @input > 23.5V)
- Maximum discharge power capacity: 200W (Channel 130W)
- Maximum regenerative discharge power capacity: 2000W (Channel 1400W)
- Maximum extra discharge power capacity: 3200W (Channel 1600W @40V/40A)
- Maximum current drain for balancing: 2.4A@Syn. Mode 1.2A@Asyn. Mode



Device Introduction

● 4010DUO Parts & Interface Introduction



● 4010DUO Buttons Function & Icons Description

Part buttons allow to quick access to certain features when using 4010DUO, familiar with the icons on the interface can understand better the working status of the charger, as shown in following chart:

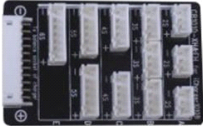
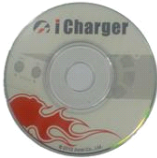
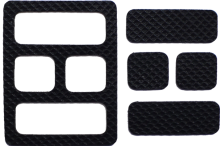
Name	Functions & Use
KNOB	Press: confirm Counterclockwise rotation: up Clockwise rotation: down Long press: pop up manage menu via long press on <i>BATTERY MEMORY SELECTION</i> interface exit the program after saving via long press on <i>BATTERY SETUP</i> interface
TAB/SYS	Long press: enter <i>SYSTEM MENU</i> via long press on initial interface, and return to the previous menu via long press on the rest interface Click: can act as backspace when editing memory name on <i>MEMORY SETUP</i> , and return to the previous menu via clicking on the rest interface



STATUS-1	Long press: measure internal resistance of CH-1 via long press on initial interface, and to pop up the parameters setup interface via long press when running program Click: switch to the information display of CH-1
STATUS-2	Long press: measure internal resistance of CH-2 via long press on the initial interface, and to pop up the parameters setup interface via long press when running program Click: switch to the information display of CH-2
STOP/START-1	Click: Click on the initial interface to enter <i>CH-1-BATTERY MEMORY SELECTION</i>, and click again to return the initial interface Long press: long press on the initial interface to enter the last running program of <i>Run Program</i> on CH-1, and long press again to run the selected program
STOP/START-2	Click: Click on the initial interface to enter <i>CH-2-BATTERY MEMORY SELECTION</i>, and click again to return the initial interface Long press: long press on the initial interface to enter the last running program of <i>Run Program</i> on CH-2, and long press again to run the selected program
STATUS-1+STOP/START -1	Press simultaneously on initial interface to enter <i>CH-1-MONITOR SETTINGS</i> on CH-1
STATUS-2+STOP/START -2	Press simultaneously on initial interface to enter <i>CH-2-MONITOR SETTINGS</i> on CH-2
STOP/START -1+STOP/START -2	Long press simultaneously on <i>Run Program</i> interface, two channels will run the same program simultaneously
	Fan status: a. Grey shows no running b. Green shows running (the higher the green shows, the faster the fan runs, and vice versa)
	SD card status: a. Grey for the SD card is not inserted b. Green for the SD card has been inserted and can be used normally
	USB status: a. Grey for not connecting USB b. Green for has connected USB



● 4010DUO Standard Accessories

USB data line #1  700mm	Power cable #1  600mm
Standard mini USB data line	Power input cable
Balance connector conversion board #2  70X44mm	Output cable #2  320mm
Suit for Align/Dualshy battery etc.	Banana gold plug power output cable (single channel)
Balance wire for balance board #2  150mm	CD-ROM #1 
Suit for Align/Dualshy battery etc.	User's manual & Software
Anti-slip rubber feet #4 	
Anti-slip rubber feet to prevent the charger slipping.	

● 4010DUO Optional Accessories

Temperature sensor lead #2  350mm	Dual balance wires for balance board #2  150mm
XP2.54 interface temperature sensor lead	11Pin-11Pin dual balance wire
Dual channel output cable #1  350mm	
Banana gold plug power output cable (two channels)	

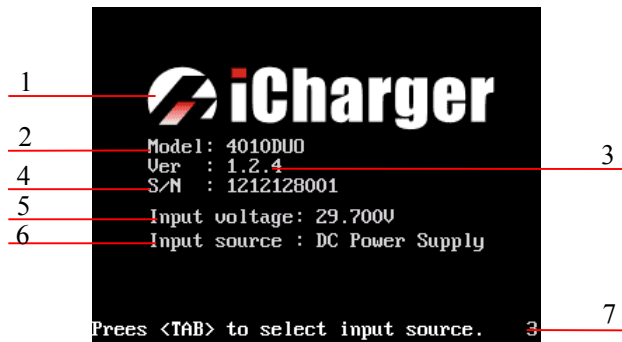


iCharger Charge/Discharge Setup & Use

4010DUO iCharger can charge/discharge LiPo, Lilo, LiFe, NiHM, NiCd, Pb batteries, this manual divides into three parts to introduce features and use for LiXX, NiXX, Pb batteries.

● Power Supply Setup

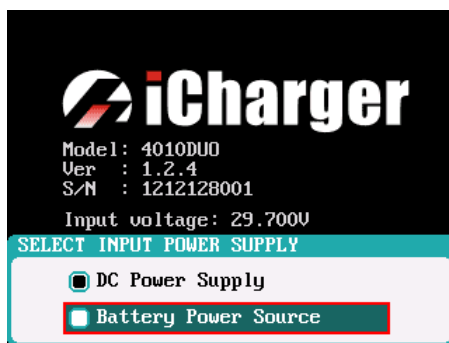
The charger boots automatically when power on and the initial interface will display LOGO, charger relevant information, power source and message etc.



Booting Interface

- | | |
|------------------------|------------------|
| 1: Logo | 2: Model |
| 3: Version | 4: Series number |
| 5: Input power voltage | |
| 6: Input power source | |
| 7: Hint message | |

System will delay **5S** after booting, during this period, press **TAB/SYS** button to change the input source type, while press any other buttons to enter the initial interface.



Note: Set type of input power supply in *SYSTEM MENU*→*Charger Setup*→*Power Supply*, see details in Page20 **4010DUO Parameters Setup**.

After selecting the input power supply, confirm and enter the initial interface.



Initial Interface

- 1: CH-1 Channel Information Display
- 2: CH-2 Channel Information Display
- 3: Status Display

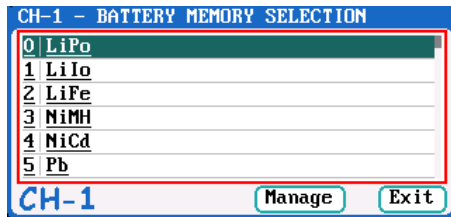
Note: The specific display of each region can refer to the introduction in Page10 & Page11 **Program Running Status & Error Messages**.



● Program Add & Manage

Click **STOP/START-x** button on the initial interface to pop up the *BATTERY MEMORY SELECT* window.

4010DUO has 6 built-in programs before it enters to the market (shown in following picture), which cannot be deleted and limit for editing. The built-in program with underline is distinguished from the customized program by users.



Click "Manage" (or long press **KNOB**) to pop up the *MANAGE* after exiting focus via pressing **TAB/SYS**, and click "Edit" to enter *MEMORY SETUP* to edit the program, and click "Add" to add new program and enter its editing interface at the same time.



Note: If the program selected is a built-in program, "Copy From..." and "Delete" options are shown in inactive status, and unable to be set.

● Run Program for Charger

After selecting program on *BATTERY MEMORY SELECT*, click to enter *Run Program* interface (long press **STOP/START-x** button on the initial interface to enter *Run Program* of the last running program directly), as below:



- 1: Run Program Selection
- 2: Common Parameters Setup
- 3: Auto- save Hint



Note: 1. The built-in program is saved by default automatically to the running program, while the program customized by users can set in *MEMORY SETUP*→*MEMORY OPTION*→*Auto save before the program runs*.

2. After setting the "capacity", the C-rate will appear behind the current, and when the C-rate exceeds the certain value, the system will alarm beeps and warn (shown in following picture). The specific value of battery is: LiXX battery :> 3C, NiXX battery :> 2C, Pb battery :> 0.3C

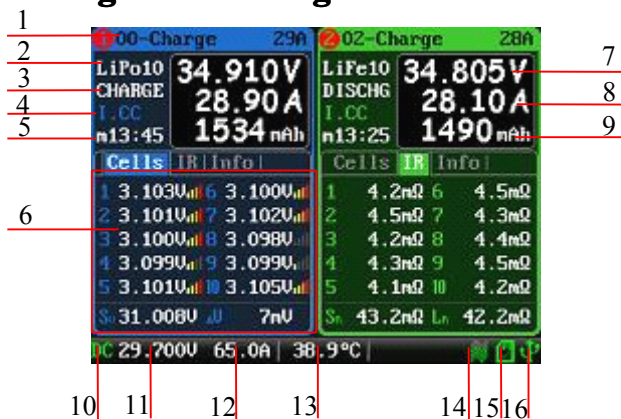


After selecting the program to run, click confirmation to pop up *RUN PROGRAM* window, as below:



Click **Yes** to run the program, click **No** to cancel.

● Program Running Status



- 1: Running program name
- 2: Battery type
- 3: Running channel status
- 4: Channel control status/external temperature
- 5: Running program time
- 6: Multipage information
- 7: Output voltage
- 8: Output current
- 9: Output capacity
- 10: Power source
- 11: Input voltage
- 12: Input current
- 13: Internal temperature
- 14: Fan status
- 15: SD card status
- 16: USB status

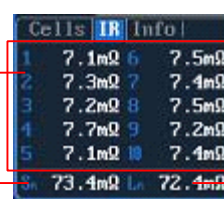
See details in Page34 **Status Indication of Running Channel & Status Indication of Channel Control.**

Press **STATUS-x** button when running program to switch to multipage information display, as below:



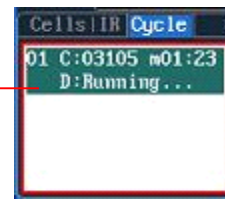
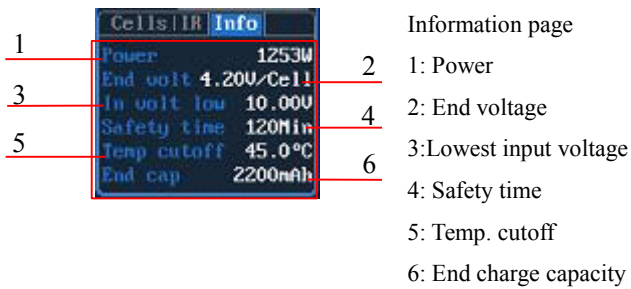
Cells voltage information

- 1: Cells voltage
- 2: Cells voltage sum
- 3: Maximum cells voltage difference
- 4: Balance current indication



IR information

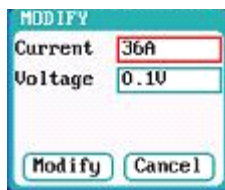
- 1: Cell internal resistance
- 2: Pack internal resistance
- 3: Line resistance



Note: Different types of battery and program have different multipage information display, see details as below:

Types of battery	Cells	IR	Info	Cycle
LiXX	✓	✓	✓	✓
NiXX	×	×	✓	✓
Pb	×	×	✓	✓

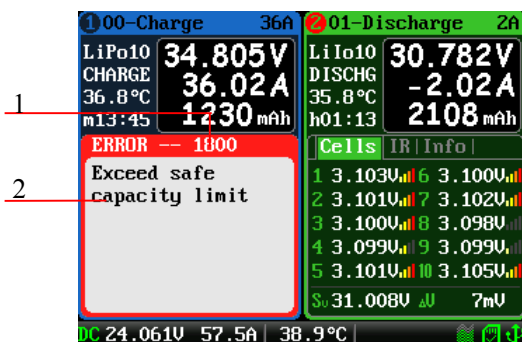
Press **STATUS-x** button for **2S** when running program to pop up **MODIFY** interface, to modify the current, discharge voltage, parameters online, as below:



Press **STOP/START-x** button when running program to stop running, and press **STOP/START-x** button again to return to the initial interface.

●Error Messages

When the 4010DUO is running, the system will stop the channel immediately and pop up the red dialog box and the buzzer alarms if it detects an error, as below:



Error Messages Status

1: Error number

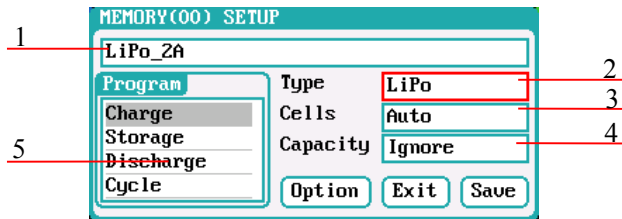
2: Error message

See all details in Page35 **Error Messages** in Appendix



● Program Edit

After adding new program or editing saved program, system will enter *MEMORY SETUP* interface, users can set or modify the program on this interface.



MEMORY SETUP Interface

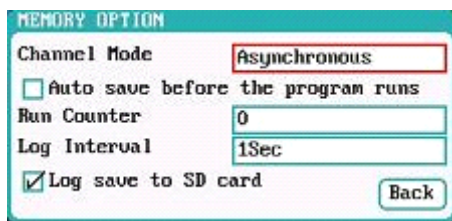
- 1: Program name 2: Types of battery
3: Number of cells
4: Battery capacity 5: Available program



Note: 1. When editing program name, the character can be selected by turning **Knob**, and clicking the **Knob** to confirm the selected character, and clicking **TAB/SYS** button to delete the character; If the program name is empty, the system will name automatically.

2. If the Editing program is the built-in program, program name and the types of battery parameters cannot be changed.

After setting the basic parameters of battery, click "**Option**" to enter *MEMORY OPTION* interface, after setting click "**Back**" to return *MEMORY SETUP*, and click "**Save**" to save.



MEMORY OPTION Interface

Channel Mode: Asynchronous (default);

Synchronous

Run Counter: 0-999; default: 0

Log Interval: 0.5-60Sec; default: 1Sec



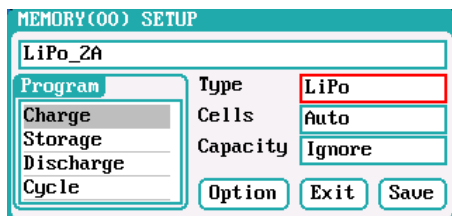
Note: 1. Channel Mode has asynchronous, synchronous available, see more details in Page31

Important Notes.

2. If select synchronous mode, the maximum current setting will change from 40A to 70A.
3. For built-in program, the *Auto save before the program runs* option is ticked by default.

■ LiXX Battery Charge/Discharge Setup

After adding program, it will switch to LiXX battery in *Type* option on the *MEMORY SETUP* interface, and set the number of *cells* and *capacity*, if not setting for the number of cells, the charger will set *Auto* by default, after editing all parameters for program, click "**Save**" to save and return to the previous interface.



As shown in above picture, the program of LiPo, LiLo, LiFe battery has: *Charge, Storage, Discharge, Cycle and Balance Only*.



① LiXX Battery Charge Setup

Select *Program*→*Charge* to enter *Charge* setup interface.

LiXX Battery Charge Program Setup

Chg Current: 0.05A-40A; default: 2A

Chg Mode: Balance (default), Not Balance

Chg End Current: 1%-50%; default: 10%

Chg Cell Volt: 3.85V/Cell-4.35V/Cell;

Default: 4.2V/Cell



- Note: 1. The charger first charges with constant current (CC) according to the user setting then turns to constant voltage (CV) when the charging voltage reaches the peak point. In the CV phase the current gradually falls, and the charger will terminate charging when the current falls below than percent of the configured charge current.
2. Charge mode has *Balance*, *Not Balance* two modes available, when choose *Balance* mode, balance board must be connected except for connecting 1S battery. The balance charge mode is for balancing the voltage of battery cells while charging. In this mode the battery balance lead must be connected to the balance port, and the charger can monitor the voltage of individual cells and adjust the input current fed into each cell to normalize the voltage.
3. Tick **Show** to display this program on *MEMORY SETUP*, and the built-in program is ticked by default.
4. When the value of charge cells voltage exceeds the recommended value (LiPo 4.2V, Lilo 4.1V, LiFe 3.6V), there will alarm and beep tones. As long as the users change the value, the main charging interface, "battery types" and "cells voltage" setting value will displayed alternately.

Switch to *Balance* mode on *Chg Mode* to active "Set..." button and click to enter *Balance* mode setup interface.

LiXX Battery Balance Setup

Balance Start: CV, CV-0.1V--1V, Always

Default: CV-0.2V

Balance Speed: User, Fast,

Normal (default), Slow

Switch to *User* mode on *Balance Speed* to active *Balance Diff*, *Balance Set Point*, *Balance Over Charge*, *Balance Done Delay* setting, after setting click "Back" to return to the previous interface.

LiXX Battery Charge Balance Setup

Balance Diff: 1mV-10mV; default: 5mV

Balance Set Point: 1mV-50mV; default: 5mV

Balance Over Charge: 0mV-10mV; default: 0mV

Balance Done Delay: 0Min-20Min; default: 1Min



Note: If *Balance Diff* value is smaller, the voltage difference between batteries will be smaller and time-consuming will be more when program ends.

If *Balance Set Point* value is smaller, the battery will be closer to the setting cut-off voltage and time-consuming will be more when program ends.

Balance Over Charge, the maximum overcharge compensation voltage acts as accelerated charge, and the larger the value, the more obvious of accelerated charge.

For example: Charge Lipo with *Vstd*, set *Balance Over charge* to *Vboc*, the cells internal resistance

detected is *Ri*, when the charge current is *Ia*, the actual CV value of cells is *Va*

IF $Ri * Ia > Vboc$ THEN

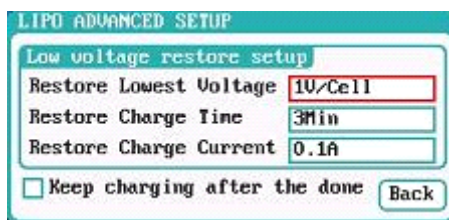
$Va = Vstd + Vboc$

ELSE

$Va = Vstd + Ri * Ia$

Please set this parameter after understanding fully, or keep the default value of 0. The value of *Balance Done Delay* is larger; the battery is closer to the setting cut-off voltage when program ends.

Click "**Advanced**" to enter *LIXX ADVANCED SETUP*, after setting click "**Back**" to return to the previous interface.



LiXX Battery Charge Advanced Setup

Restore Lowest Voltage: *0.5V/Cell-2.5V/Cell*;

Default: 1V/Cell

Restore Charge Time: *1Min-5Min*; *default: 3Min*

Restore Charge Current: *0.02A-0.5A*; *default: 0.1A*

Note: 1. When the battery over-discharges, the charger will charge it with smaller current at the beginning then turns to normal charging program when the battery voltage reaches the normal value, otherwise the program will stop running.

2. After charging, the battery may not be completely filled; tick *Keep charging after the done* to charge the battery with smaller current when charging ends.

Click "**Safety**" to enter *CHARGE SAFETY SETUP*, after setting click "**Back**" to return to the previous interface.



LiXX Battery Charge Safety Setup

Cut-Temp: *26°C-86°C*; *default: 45°C*

Max Capacity: *50%-200%*; *default: 120%*

Safety Timer: *0Min-9999Min*; *default: off*

Note: *Cut-Temp.* is the maximum safety temperature of the battery and the program will stop running when the temperature the sensor detected reaches this value, in order to protect the battery from being damage by the high temperature.



②LiXX Battery Storage Setup

This mode is for storing LiXX battery that is not to be used for an extended period. The charger determines whether to charge or discharge the battery based on the configured target voltage. If the battery voltage exceeds the target storage voltage it will start to discharge, while lower than the target storage voltage it will start to charge.

Select *Program*→*Storage* to enter *Storage* setup interface.

Storage Cell Voltage: 3.7V/Cell-3.9V/Cell;

Default: 3.85V/Cell

Storage Compensation: 0V/Cell-0.2V/Cell;

Default: 0.01V/Cell



Note: 1. *Accelerated storage*: accelerated storage via internal resistance correction. Tick *Accelerated storage* to accelerated storage.

2. *Storage Compensation* is the compensation for the battery voltage fallback: for storage charge, the actual storage voltage=Storage Cell Voltage + Storage Compensation; for storage discharge, the actual storage voltage=Storage Cell Voltage - Storage Compensation.

③LiXX Battery Discharge Setup

Select *Program*→*Discharge* to enter *Discharge* setup interface.

LiXX Battery Discharge setup

Discharge Current: 0.05A-40A; default: 2A

Discharge Voltage: 3V/Cell-4.1V/Cell;

Default: 3.5V/Cell

End Current: 1%-100%; default: 50%

Regenerative Mode: OFF (default),

To input, To channel



Note: 1. The charger first discharges with constant current (CC) according to the user setting then turns to constant voltage (CV) when reaches the discharged voltage. In the CV phase the current gradually falls, and the charger will terminate discharging when the current falls below than percent of the configured discharge current.

For example: the default value of Discharge Current is 2A, the default value of End Current is 50%: End Current=2A*50%=1A.

2. Regenerative mode has OFF, To input, To channel three modes available, see more details in Page32 **Important Notes**.

When switch to *To channel* on *Regenerative Mode*, "Set..." button changes to the operational state, click to enter *To channel* setup interface, after setting click "Back" to return to the previous interface.

LiXX Battery Channel Regenerative Setup

Channel Join: Not available

Voltage Limit: 0.1V-40V; default: 12V

Current Limit: 0.05A-40A; default: 1A

Note: This setting is mainly in charge of controlling the regenerative voltage and current, to prevent the charger from being damaged by regenerative charge.



Click "**Advanced**" to enter *LiXX DISCHARGE ADVANCED SETUP* interface, after setting click "**Back**" to return to the previous interface.



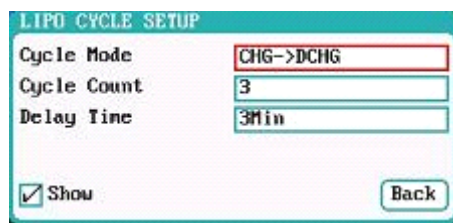
 **Note:** 1. Tick *Extra Discharge Enable* to active extra discharge enable, see more details in Page33 **Extra Discharge**.

2. Tick *Balance enable* to active balance discharge; when discharge enters the CV phase, it starts to balance for the cell voltages.

Click "**Safety**" to enter *DISCHARGE SAFETY SETUP* interface, see details about setting in Page13 **LiXX Battery Charge Setup**.

④LiXX Battery Cycle Setup

Select *Program*→*Cycle* to enter *Cycle* setup interface, after setting click "**Back**" to return to the previous interface.



LiXX Battery Cycle Setup

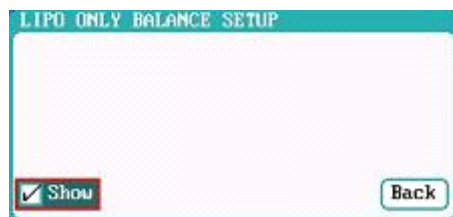
Cycle Mode: *CHG*→*DCHG* (default);
DCHG→*CHG*

Cycle Count: 1-99; default: 3

Delay Time: 0Min-9999Min; default: 3Min

⑤LiXX Battery Only Balance Feature

Select *Program*→*Balance Only* to enter *Balance Only* setup interface, after setting click "**Back**" to return to the previous interface.

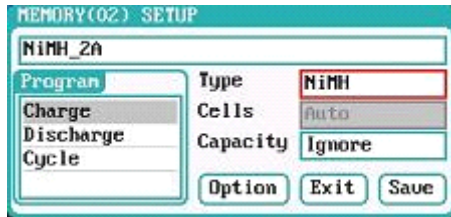


 **Note:** *Only Bal* is the program to perform balance feature, cannot charge/discharge the Battery.



■ NiXX Battery Charge/Discharge Setup

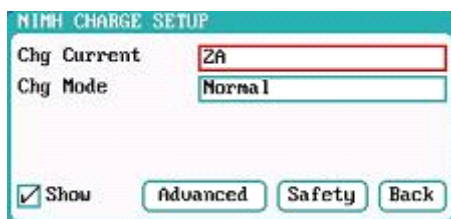
After adding program, it will switch to NiXX battery in *Type* option on the *MEMORY SETUP* interface, and set the capacity, the number of cells for NiXX battery cannot be set, and the charger sets *Auto* by default, after editing all parameters for program, click "Save" to save and return to the previous interface.



As shown in above picture, the program of NiMH, NiCd have: *Charge*, *Discharge* and *Cycle*.

① NiXX Battery Charge Setup

Select *Program*→*Charge* to enter *Charge* setup interface.



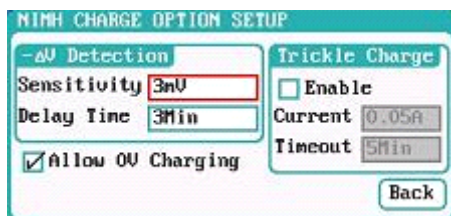
NiXX Battery Charge Setup

Chg Current: *0.05A-40A; default: 2A*

Chg Mode: *Normal (default), Reflex*

Note: Charge Mode has *Normal*, *Reflex* two modes available; use the reflex mode to charge battery can reduce heat of battery; please see charging principle in Page32 **Important Notes**.

Click "Advanced" to enter *NiXX CHARGE OPTION SETUP* interface, after setting click "Back" to return to the previous interface.



NiXX Battery Charge Advanced Setup

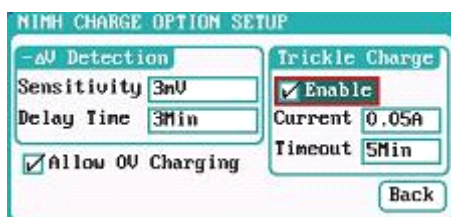
Sensitivity: *1mV-20mV; default: 3mV*

Delay time: *0Min-20Min; default: 3Min*

Note: Tick *Allow OV Charging* to allow charge with OV.

Allow OV Charging suits for some applications (such as charge the battery pack in the transmitter, the circuit in series with a diode).

Tick *Trickle Enable*→*Enable* to active trickle charge and set the parameters, after setting click "Back" to return to the previous interface.



NiXX Battery Trickle Charge Setup

Trickle current: *0.02A-1A; default: 0.05A*

Trickle timeout: *1Min-999Min; default: 5Min*

Note: Tick *Enable* to active trickle charge.

Trickle charge is based on a smaller current to charge the battery for a period, to reduce battery consumption and extend battery usage time.



Click "**Safety**" to enter *CHARGE SAFETY SETU* interface, see details about setting in Page13 **LiXX Battery Charge Setup**.

② NiXX Battery Discharge Setup

Select *Program*→*Discharge* to enter *Discharge* setup interface.

LiXX Battery Discharge Setup

Discharge Current: *0.05A-40A; default: 2A*

Discharge Voltage: *0.1V-40V; default: 0.1V*

End Current: *1%-100%; default: 50%*

Regenerative Mode: *OFF (default), To input,
To channel*

 **Note:** 1. Regenerative mode has *OFF*, *To input*, *To channel* three modes available, see more details in Page33 **Important Notes**.

2. *To channel* Setup please see Page12 **LiXX Charge/Discharge Setup**.

Click "**Safety**" to enter *DISCHARGE SAFETY SETUP* interface, see details about setting in Page13 **LiXX Battery Charge Setup**.

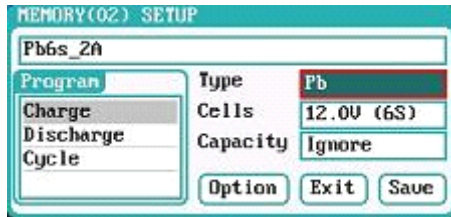
③ NiXX Battery Cycle Setup

Select *Program*→*Cycle* to enter *Cycle* setup interface, see details about setting in Page16 **LiXX Battery Cycle Setup**.



■ Pb Battery Charge/Discharge Setup

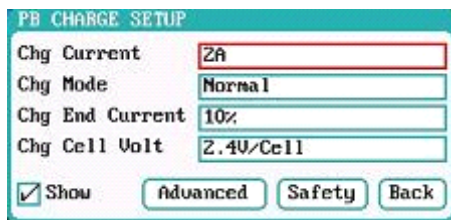
After adding program, it will switch to Pb battery in *Type* option on the *MEMORY SETUP* interface, and set the number of *cells* and *capacity*, after editing all parameters for program, click "**Save**" to save and return to the previous interface.



As shown in above picture, the program of Pb battery has: *Charge*, *Discharge* and *Cycle*.

① Pb Battery Charge Setup

Select *Program*→*Charge* to enter *Charge* setup interface.



LiXX Battery Charge Setup

Chg Current: 0.05A-40A; default: 2A

Chg Mode: Normal (default), Reflex

Chg End Current: 1%-50%; default: 10%

Chg Cell Volt: 2V/Cell-2.6V/Cell;

Default: 2.4V/Cell



Note: 1.The charger first charges with constant current (CC) according to the user setting then turns to constant voltage (CV) when the charging voltage reaches the peak point. In the CV phase the current gradually falls, and the charger will terminate charging when the current falls below than percent of the configured charge current.

2.Charge mode has *Normal*, *Reflex* two modes available, about the *Reflex* mode (Reflex) please see Page32 **Important Notes**;

Click "**Advanced**" to enter *PB ADVANCED SETUP* interface, see details about setting in Page13 **LiXX Battery Charge Setup**.

Click "**Safety**" to enter *CHARGE SAFETY SETUP* interface, see details about setting in Page13 **LiXX Battery Charge Setup**.

② Pb Battery Discharge Setup

Select *Program*→*Discharge* to enter *Discharge* setup interface, see details about setting in Page15 **LiXX Battery Discharge Setup**.

③ Pb Battery Cycle Setup

Select *Program*→*Cycle* to enter *Cycle* setup interface, see details about setting in Page16 **LiXX Battery Cycle Setup**.



4010DUO Parameters Setup

● 4010DUO Parameters Setup

Press **TAB/SYS** button for **2S** on the initial interface to enter *SYSTEM MENU* interface, setting and testing of the system parameters, storage and servo can be completed on this interface.



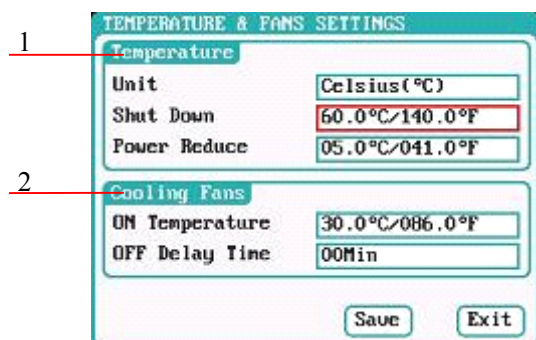
- 1: Charger Setup Menu
- 2: Temp. & Fans Setup
- 3: Beep Tone Setup
- 4: LCD Setup
- 5: Output Power Setup
- 6: Power Supply Setup
- 7: Save & Load Configuration Setup
- 8: Calibration
- 9: Extra- Function
- 10: Log Files Manage
- 11: Servo Test
- 12: Pulse Test

■ Charger Setup

After setting all parameters, click “**Save**” to save and return to the previous interface.

① Temp. & Fans Setup

Select *SYSTEM MENU*→*Charger Setup*→*Temperature&Fans* to enter the setup interface, after setting click “**Save**” to save and return to the previous interface.



- 1: Temperature setup
 - Unit: *Celsius (default), Fahrenheit*
 - Shut Down: *60°C-75°C; default: 75°C*
 - Power Reduce: *5°C-20°C; default: 16°C*
- 2: Cooling Fans setup
 - ON Temperature: *36°C-56°C; default: 46°C*
 - OFF Delay Time: *0Min-10Min; default: 2Min*

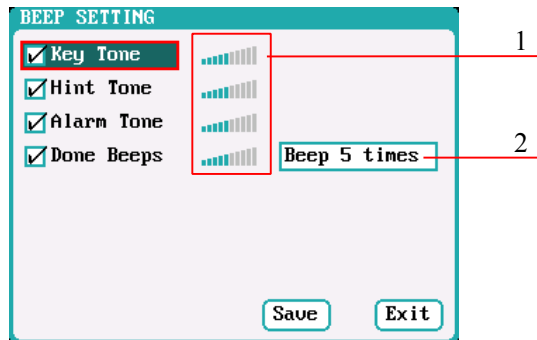


Note: When the charger internal temperature reaches to the *ON Temperature*, the fan will boot automatically to dissipate heat, and adjust speed automatically depends on the temperature increasing or decreasing. When the temp. exceeds (*Shut Down - Power Reduce*), the charger will stop increasing(temp. shown in orange) via reducing the largest power limit. When the temp. reaches (*Shut Down*) temperature, the charger will shut down. [when temp. > (*Shut Down-3*), the temp. shown in red flashing]. When the temp. is lower than the *ON Temperature*, the fan will keep running within the setting time of *OFF Delay Time*.



② Beep Tone Setup

Select *SYSTEM MENU*→*Charger Setup*→*Beep Tone* to enter the setup interface.



Beep Tone Setup

1: Volume adjustment display

2: Program Done Beep Tones Selection

Beep 5times (default))

Beep 30second

Beep always

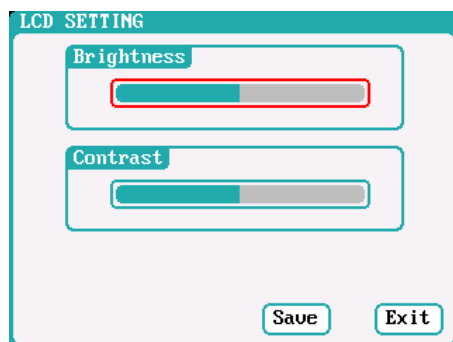
Beep 3minutes



Note: Tick the appropriate tone, and then go to Volume adjustment bar of tones to adjust the volume; If the beep tone failed to tick the corresponding volume adjustment it shows inactive; *Done Beeps* are many styles available, as shown above.

③ LCD Setup

Select *SYSTEM MENU*→*Charger Setup*→*LCD Screen* to enter the setup interface.



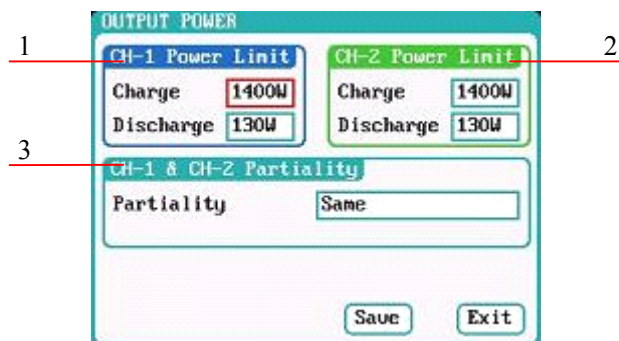
LCD Setting Interface

1: Brightness adjustment

2: Contrast adjustment

④ Output Power Setup

Select *SYSTEM MENU*→*Charger Setup*→*Output Power* to enter the setup interface.



1/2: CH-1/CH-2 Output Power Setup

Charge: Maximum Power Limit for charge

5W-1400W; default: 1400W

Discharge: Maximum Power Limit for discharge

5W-130W; default: 130W

3: CH-1/CH-2 Channel Partiality Selection

Same (default), CH-1, CH-2



Note: The maximum power limit for regenerative discharge is equal to the maximum power limit for charge.

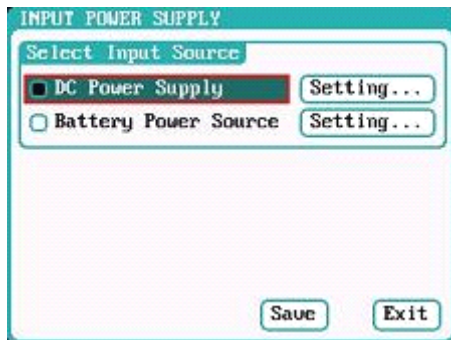
When the input or output power of charger is limited, it will trigger the CH-1/CH-2 Channel Partiality.

When Partiality switches to *Same*, charger assigns averagely the output power to two channels, switch to CH-1 or CH-2, the charger will give priority to the selected channel output power, while the output power of other channel may be reduced to 50W (discharge for 5W).

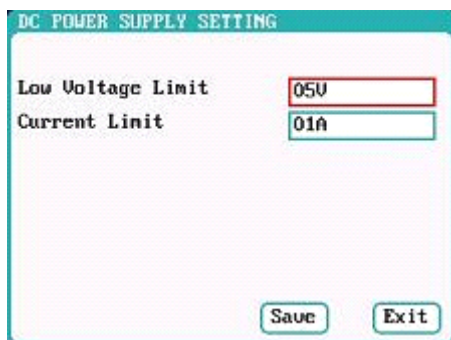


⑤ Power Supply Setup

Select *SYSTEM MENU*→*Charger Setup*→*Power Supply* to enter the setup interface.



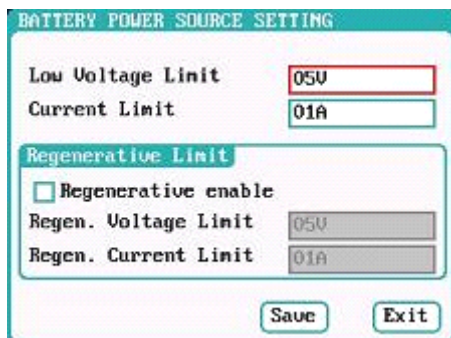
After selecting input source, click the "Setting..." followed the option, enters the relevant power supply setting to set the parameters, after setting click "Save" to save and return to the previous interface.



DC Power Supply Setting

Low Voltage Limit: *9V-48V; default: 10V*

Current Limit: *1A-65A; default: 65A*



Battery Power Source Setting

Low Voltage Limit: *9V-48V; default: 10V*

Current Limit: *1A-65A; default: 65A*

1: Regenerative Enable

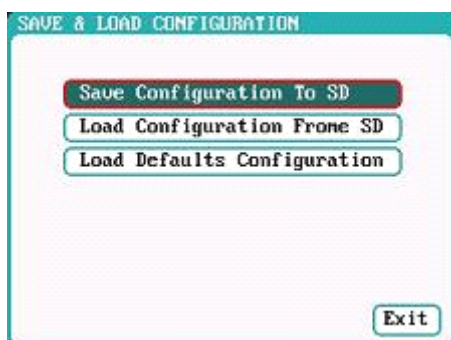
2. Regen. Voltage Limit: *9V-48V; default: 14.5V*

3. Regen. Current Limit: *1A-65A; default: 10A*

Tick *Regenerative enable* to active power supply regenerative feature, enable the charger to charge back to the power supply in the discharge process.

⑥ Save & Load Configuration Setup

Select **Save & Load Config** on *SYSTEM MENU* and enter the setup interface.



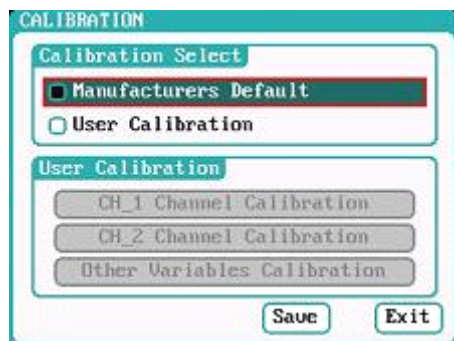
Note: 1. Users can save configuration to SD card, just load via SD card if use again.

2. After loading the configuration files, in addition to *Calibration Select*, it will cover all settings within the device.



⑦ Calibration

Select *SYSTEM MENU*→*Charger Setup*→*Calibration* to enter the setup interface.



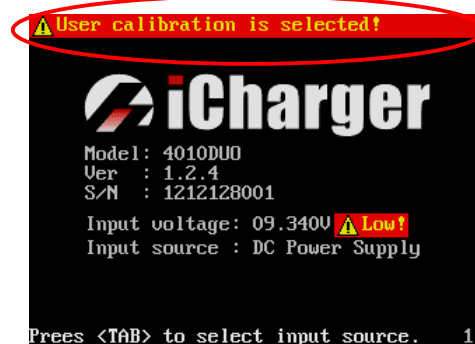
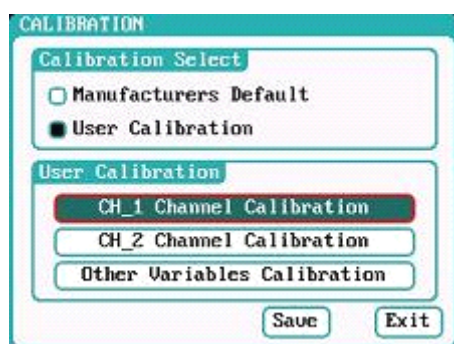
Calibration Setup Interface

Manufacturers Default: Default value

User Calibration: User calibration

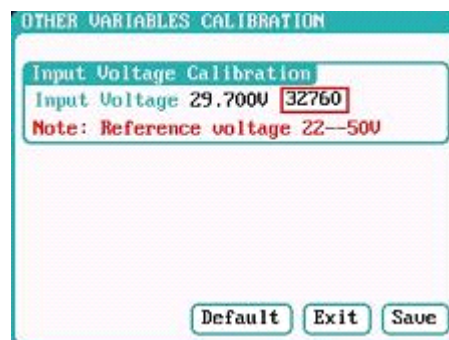
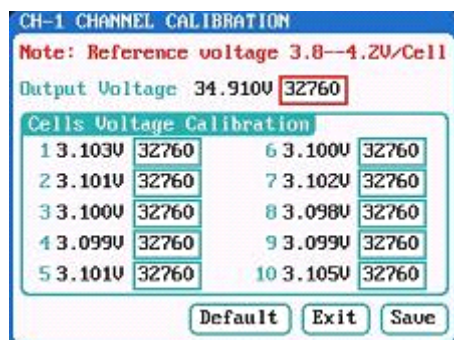
The user calibration may lead to large data deviation, and affecting the normal use; user calibration for charger is not recommended.

If users select *User Calibration*, the *User Calibration* option changes to active status; then select channel to enter the interface to calibrate.



 **Note:** User Calibration has *CH-X Channel Calibration* and *Other Variables Calibration* two options, users can calibrate charger for one channel alternatively. If users select *User Calibration*, the corresponding message will appear in the interface after booting the charger, as shown in the right picture above.

Select *CH-1/2 Channel Calibration* to enter the channel calibration interface, Select *Other Variables Calibration* to enter the other variable calibration; after Calibration, click "Save" to save and return to the previous interface; click "Default" to load default value.

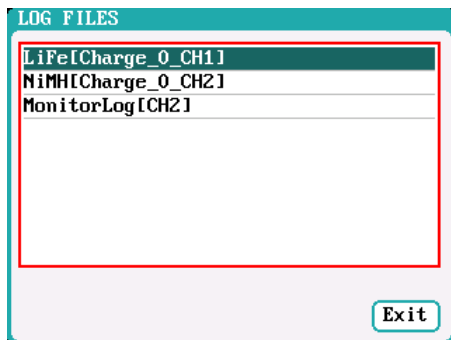




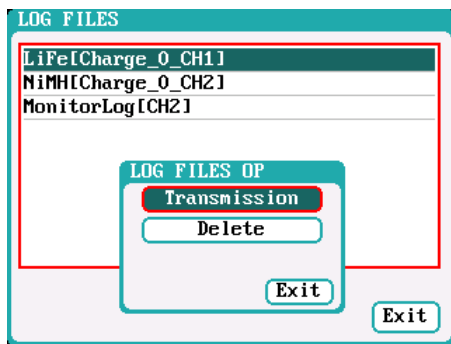
■ Extra Function

① Log Files Manage

Select *SYSTEM MENU*→*Extra Function*→*LOG FILES* to enter the manage interface.



First select and click the .TXT files when manage log files, and the system will pop up the *LOG FILES OP* dialog box.



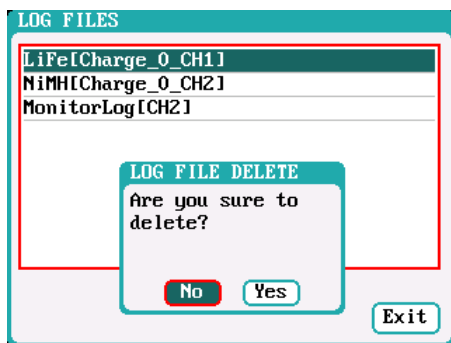
Log Files Manage Dialog

Transmission: transmission to PC

Delete: delete files

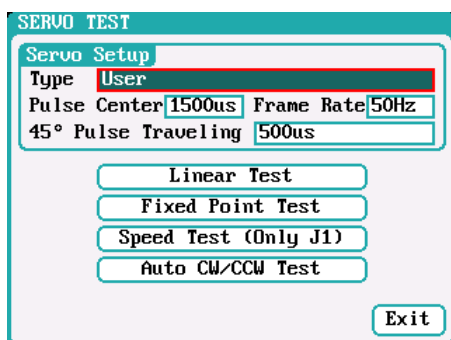
The charger must be connected with computer when select *Transmission*, and the client software has identified to the charger.

Select *Delete* to pop up the *LOG FILE DELETE* dialog box, Select **Yes** to delete this file, select **No** to cancel.



② Servo Test

Select *SYSTEM MENU*→*Extra Function*→*SERVO TEST* to enter servo test interface; insert Servo into **J1** or **J2** port to test (only **J1** port supports Speed Test, **J2** can also be used as an external power source).



SERVO TEST

Type: *Analog servo(1500us/50Hz)*

Digital servo(1500us/333Hz)

Digital servo(760us/560Hz)

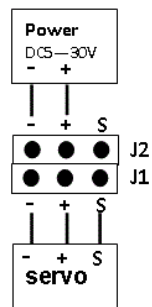
User Pulse Center: 700us-1600us

Frame Rate: 40Hz-700Hz

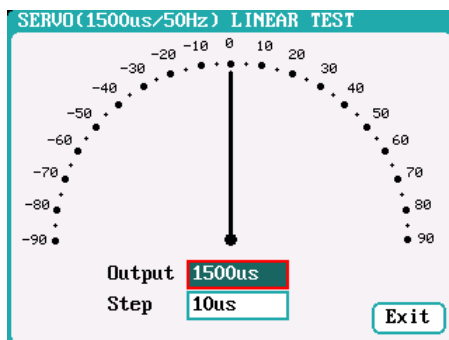
45° Pulse Traveling: 100us-1000us



J2 can be used as an external power source: If **J1(5V/1A)** cannot provide the voltage needed for servo, please through **J2** with external power source.

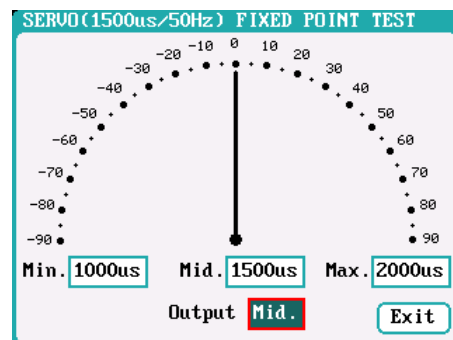


Select the test mode and go to the following corresponding interface.



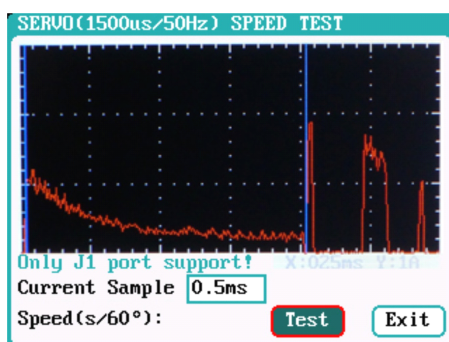
Liner Test

When turning the knob, the pointer deflects with step of 10us, and the servo responds accordingly.



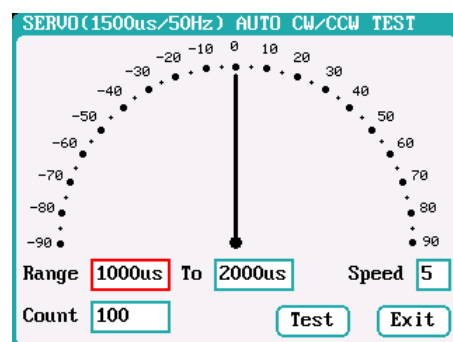
Fixed Point Test

When turning the knob, the pointer deflects among each setting values, and the servo responds accordingly.



Speed Test

Click **Test** to read the test curves and test results.



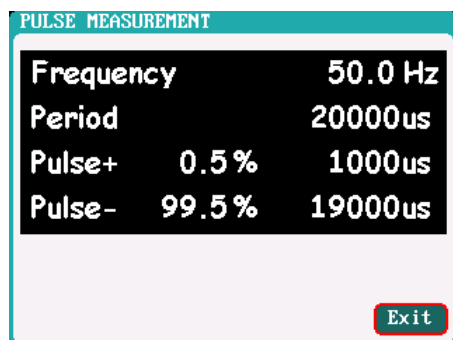
Auto CW/CCW Test

Click **Test** button then the pointer deflects the setting times at a set rate back and forth among each setting values, and the servo responds accordingly.



③Pulse Measurement

Select *SYSTEM MENU*→*Extra Function*→*Pulse Test* to enter the pulse test interface, only **J2** port supports the input signal of Pulse Measurement.



● USB & SD Card Use

4010DUO is the HID device of USB, supported by windows system directly, dispense with installing additional drivers. The USB icon will light up on the lower right corner of the screen when the 4010DUO connects with computer normally.

The SD icon will light up on the lower right corner of the screen when the SD card inserted. If 4010DUO connects with USB without running program, the new added U disk can be found on the "My Computer" of the PC, and can operate the file. *Log* files are stored in the [X: \Junsi \iC4010DUO \Log](#) folder and config. files are stored in [X: \Junsi \iC4010DUO \System](#) folder.



Note: 1. The file system of SD card must be FAT or FAT32.

2. Data in SD card needs to be backed up in case to lose.

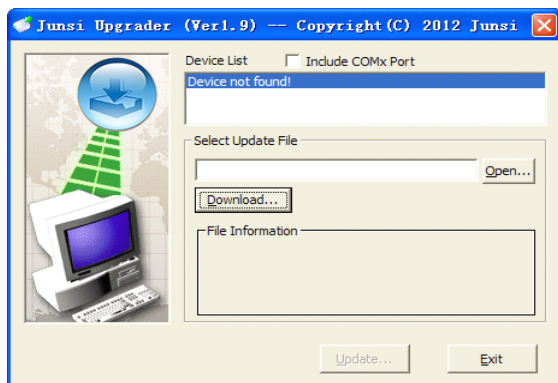
● Warranty & Service

- ① The product from the date of purchase enjoys free maintenance service within one year under normal conditions of use.
- ② Over the warranty, if need replace parts, appropriate charge will be for components and maintenance fee.
- ③ During the warranty period, any of the following circumstances will not enjoy free repairing:
 - 1) Failed use in accordance with the requirements of the user manual;
 - 2) Failure or damage caused by user to dismantle, append or modify unauthorized;
 - 3) Failure or damage due to natural disasters, bruises, collisions, improper voltage.

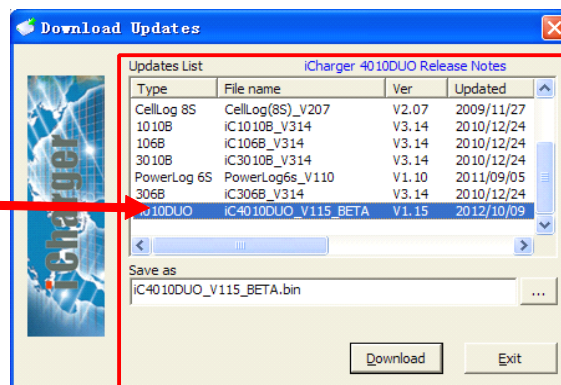
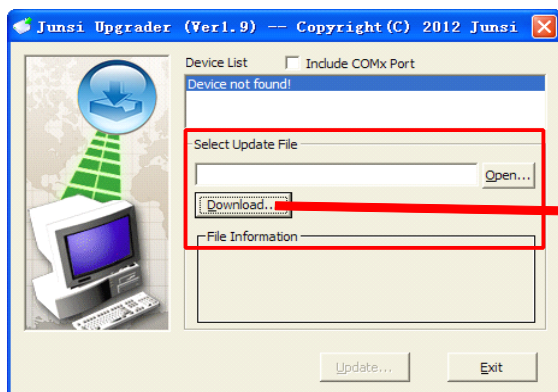


4010DUO Firmware Upgrades

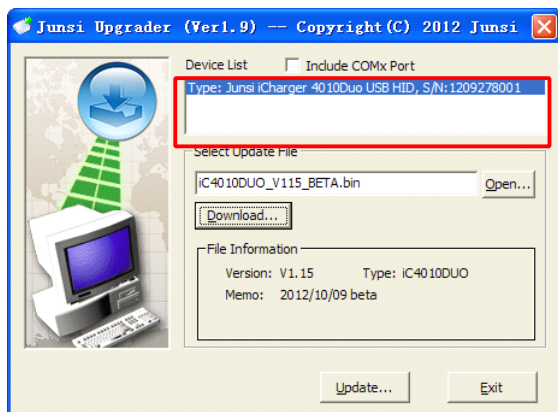
- ① Landing to the website <http://www.jun-si.com/UploadFiles/Upgrader.rar> to download above VER1.9 version upgrader zip file "Upgrader.rar", and extract to any disk on the PC.
- ② Open the extract directory `X:\upgrader\upgrader.exe`, double click "upgrader.exe" to run the upgrader and enter program interface.



- ③ Click "Open..." to open firmware file, If not a firmware file on the PC, click "Download..." to open the download window, and find the corresponding device firmware of 4010DUO, click "Download..." to download the firmware file to the PC.

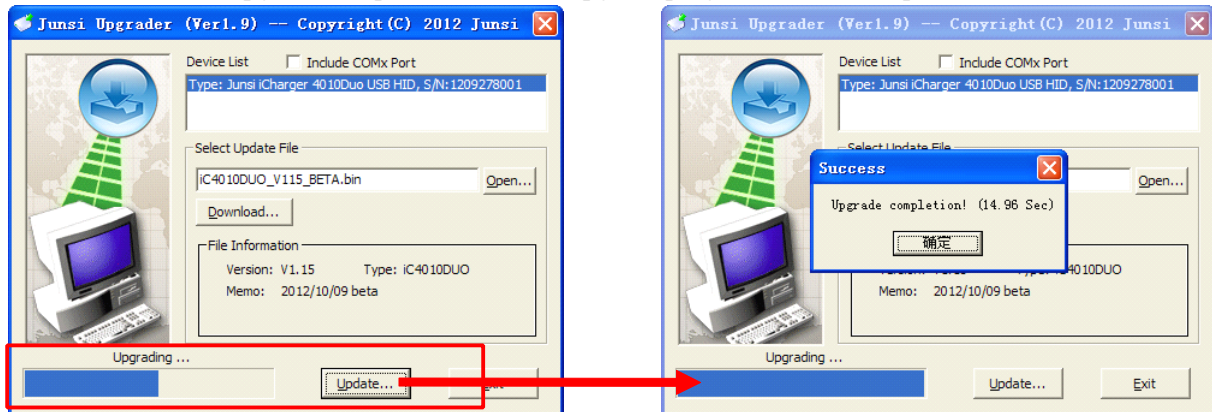


- ④ Connect 4010DUO charger to the PC via USB (windows system directly supports device, dispense with installing additional drivers). When the device information appearing in Device List column shows the upgrade tool has identified the device.





- ⑤ Click the iron "Update..." on the lower right corner, then the upgrade progress bar will appear on the lower left corner, a tone sounds for upgrade completion when the upgrade progress bar has completed.



Note:1. Upgrade failed in the case of not power outages, click "Update..." to upgrade again.

2. Upgrade failed in the case of power outages, need power on again and press **knob**, **STATUS-2** and **STOP/START-2** buttons at the same time and repeat the above steps to upgrade again.

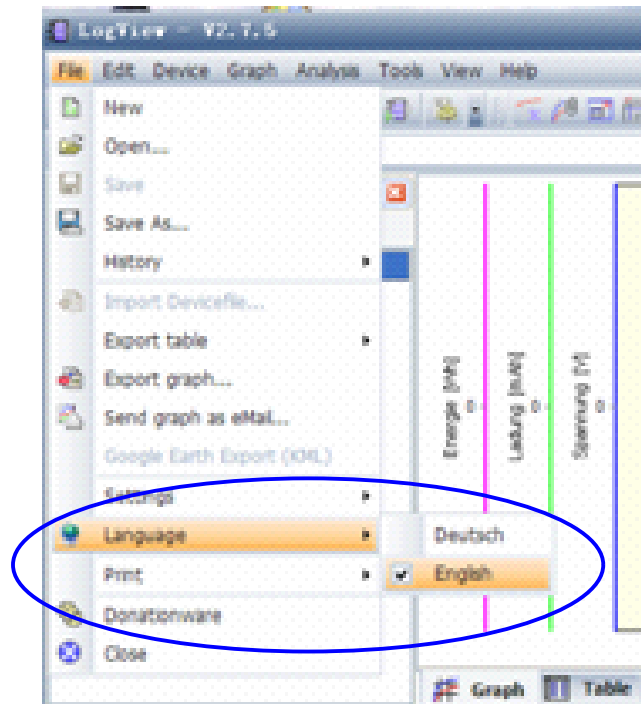


Use Logview for 4010DUO

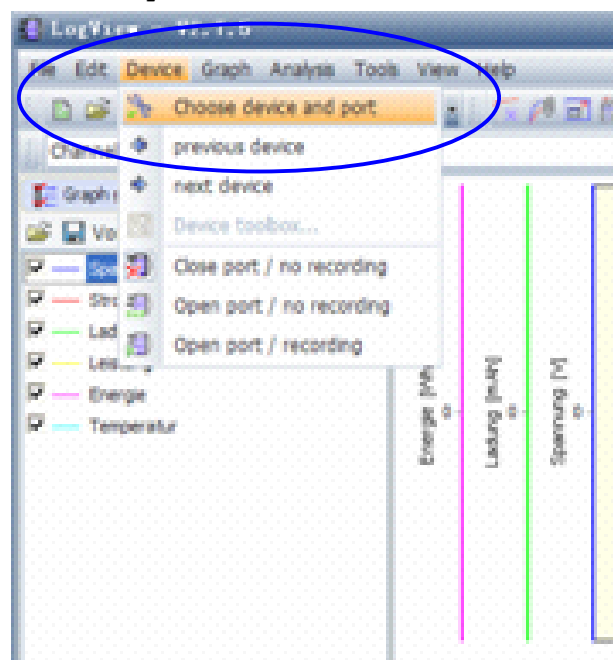
First, gratitude to the development team of Logview, more details please see <http://www.logview.info>.

Communication steps:

- ① To install the software Logview, start the procedure of [X:\logview\LogViewInstaller.exe](#) (here X is the drive letter designator for the CD-ROM drive).
- ② Connect the iCharger with PC via USB port (make sure USB driver has been installed)
- ③ Start **LogView**
 - 1) Please choose language first;

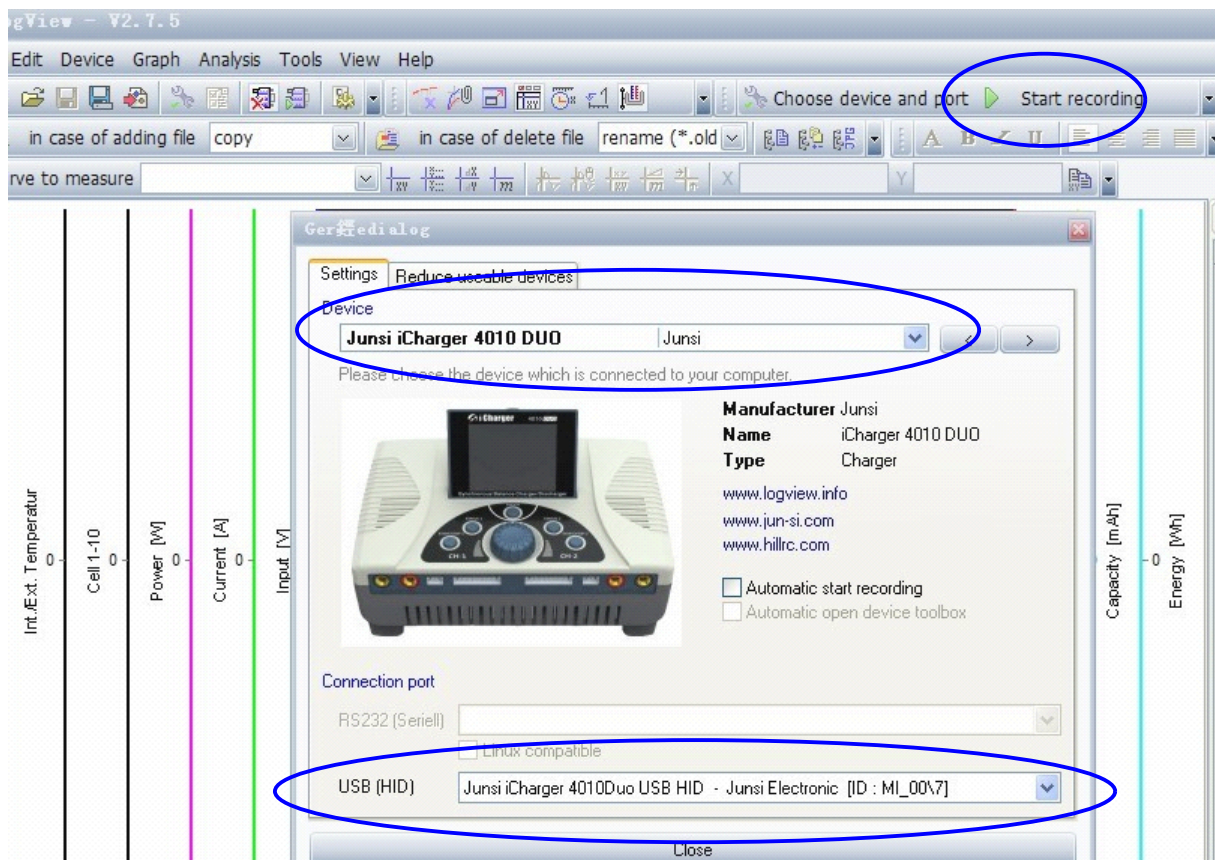


- 2) Choose **Device** → **Choose device and port**;





- 3) Choose **Junsi iCharger4010DUO** in the following options of **Device**, and then choose the correct communication Port;



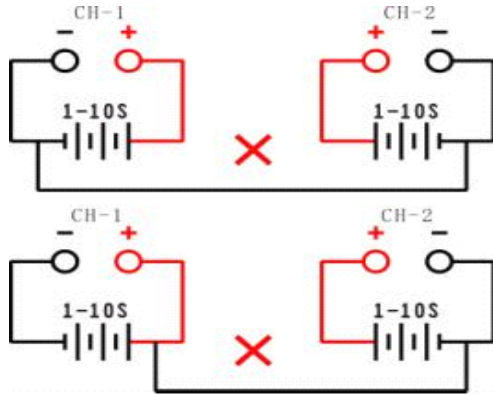
- 4) Start iCharger charge/discharge mode, then click **Start recording** to record data. See other functions of this software on "Help".



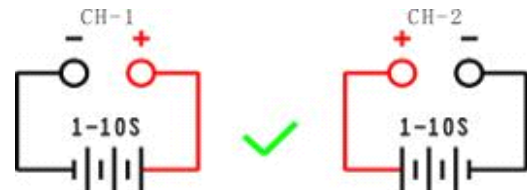
Important Notes

• Channel Mode

1. Channel Asynchronous Mode: i.e. CH-1 and CH-2 work independently.



Picture1: Error Connection



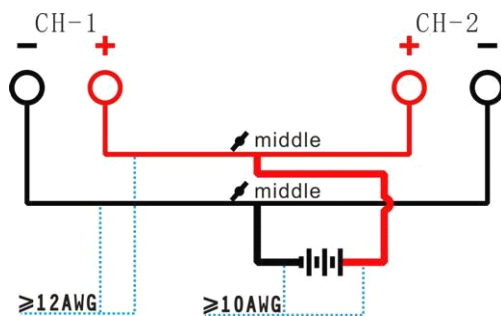
Picture2: Correct Connection

Go to *MEMORY SETUP*→*Option*→*Channel Mode* to select *Asynchronous*.

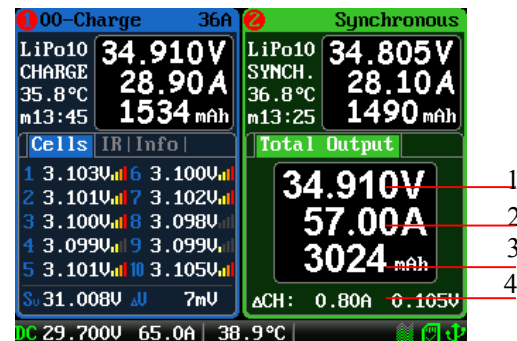


Note: On this mode, the two channels must have not any external electrical connection; otherwise it will damage the charger. Cannot charge with connection as shown in picture 1, the correct connection is shown in picture2.

2. Channel Synchronous Mode: i.e. CH-1 & CH-2 are controlled at the same time to charge/discharge one battery pack.



Picture 3



Synchronous mode display:

- 1: The total voltage of dual-channel
- 2: The total current of dual-channel
- 3: The total capacity of dual-channel
- 4: Channel current & voltage difference

Go to *MEMORY SETUP*→*Option*→*Channel Mode* to select *Synchronous*.

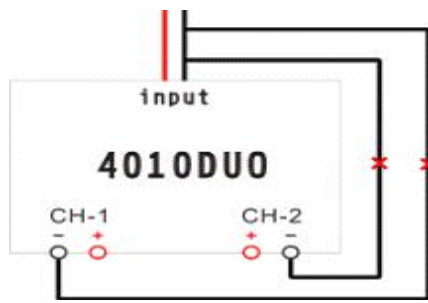
On this mode, the maximum current can up to 70A, power capacity is the sum of two channels limit.



Note: The two channels charge one battery pack simultaneously must connect as shown in picture 3, and the two channels must work in synchronous mode, or it will damage the charger.



- **The Power Input Ground cannot be Communicated With the Output Ground:**

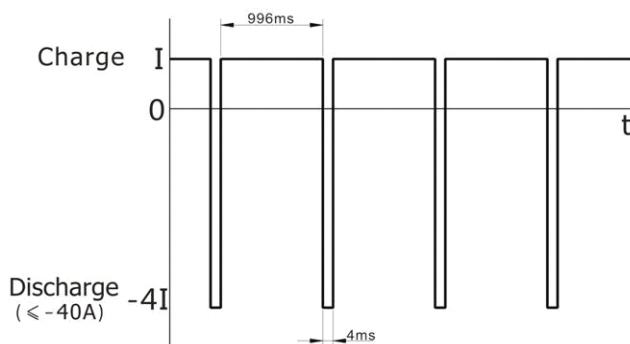


Picture 4



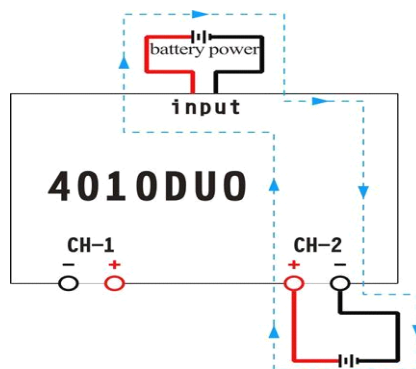
Note: The power lead of the input cannot be connected directly to the output (see picture 4), and the voltage of input power supply cannot have too large instantaneous fluctuations, otherwise it will damage the charger.

- **Reflex Charge Mode:**



Note: Reflex charge mode only supports NiMH battery, Pb battery, not support lithium battery. Using reflex charge mode to charge battery can reduce effectively the heat of the battery; go to the *MEMORY SETUP* → *Charge* → *Chg Mode* to select *Reflex* mode.

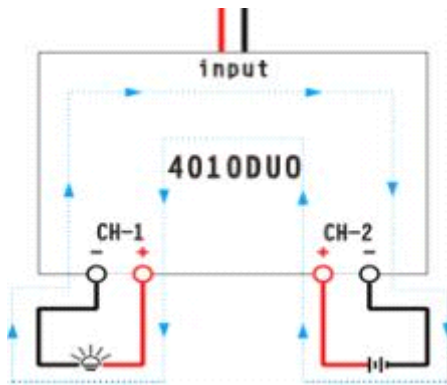
- **Power Regenerative Mode:**



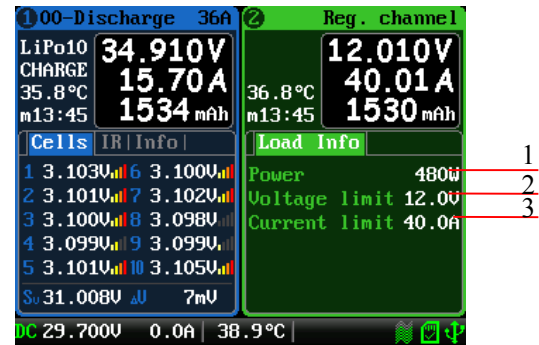
Power Regenerative Mode: Power regenerative mode is when the power supply for the charger acts as "battery power", the charger will charge for "battery power" during the process to discharge the battery. Go to *MEMORYSETUP* → *Discharge* → *Regenerative Mode* to select *To input*



• Channel Regenerative Mode:



Channel Regenerative Mode



Channel Regenerative Mode Display:

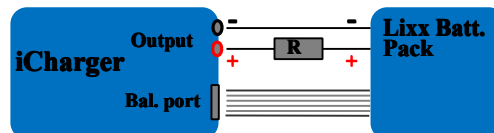
- 1: Regenerative Power
- 2: Regenerative Voltage Limit
- 3: Regenerative Current Limit

Channel Regenerative Mode is for discharging from one channel to another channel, the current version only supports resistor and bulbs discharge, but the coming versions will realize the battery regenerative.

Go to *MEMORY SETUP - Discharge - Regenerative Mode* to select *To channel* mode.

• Lithium Battery Extra Discharge Mode:

You can expand the iCharger's discharge power capacity by connecting the external capacity resistance. What should pay special attention is that, when expanding discharge, the balance port must connect to the battery and the expanding capacity resistance R should be series connected to the positive pole (See in the following diagram).



In this mode, the lithium battery discharges through iCharger and R, $P = P_i + P_r$, (P_i is charger's wasted power capacity; P_r is wasted power capacity by resistance). P_i is limited by the set charger's maximum discharge power capacity.

External capacity resistance's setting:

$$R = V_{bat} / I_{set};$$

$$P = V_{bat} * I_{set};$$

R: The value of the external capacity resistance

P: Rating capacity of the external capacity resistance

Iset: Discharge current

Vbat: Battery voltage

For example: discharge a pack of 20V lithium battery at 7A

$$R = 20V / 7A = 2.85\Omega$$

$$P = 20V \times 7A = 140W$$



Appendix

●Status Indication of Running Channel

Status	Status Indication	Status	Status indication
No display	No program, can select program to run	TRICK	Trick charging status, keep small current for a while after finishing charging NiCd or NiMH
STOPS	Stop status, press “stop” button to stop the running program	MONITO	Monitor status, only monitor the data
START	Start the program	FLOAT	Float charge, support Pb battery
CHECK	Check status before running program	SYNCH.	Synchronous state, this channel run with another channel in synchronously
CHARGE	Charge status	LOAD	Load status, this channel works on the load control status of Channel regenerative
DISCHG	Discharge status	WAIT	Waiting status
PRE_C	Pre-charge, program will pre-charge when the cell voltage is too low	CY_DE	Cycle delay status
KEEP	Keep charging status, keep charging for a while after setting pre-charge	OVER!	Over status
BAL	Independent balance status. Only balance the Li-battery, not charge	ERROR	Error status

●Status Indication of Channel Control

Status	Status Indication	Status	Status Indication
O.CV	Constant voltage status of output voltage	I.CC	Constant current status of input current
B.CV	Constant voltage status of Li-battery cells voltage	I.CP	Constant status of input power
O.CC	Constant current status of output current	O.C0	0 current regulation status
C.CP	Constant status of output power capacity	O.CP	Total power regulation status
C.TP	Temperature power reduce status	C.BL	Channel imbalance regulation status
I.CV	Constant status of input voltage	O.PC	Channel power containment regulation status

**• Error Messages**

Error NO.	Error Messages	Error Description
02XX	"Input over voltage"	The input voltage is too high
03XX	"Input under voltage"	The input voltage is too low
04XX	"Output over voltage"	The output voltage is too high
05XX	"Low battery voltage"	The voltage of the connected battery is too low
06XX	"High battery voltage"	The voltage of the connected battery is too high
07XX	"Output over current(+)"	Output over current (+)
08XX	"Output over current(-)"	Output over current (-)
09XX	"Input over current(+)"	Input over current (+)
10XX	"Input over current(-)"	Input over current (-)
11XX	"The internal temperature is too high"	The internal temperature is too high
12XX	"The internal temperature is too low"	The internal temperature is too low
13XX	"Connection check error"	Connection check error
14XX	"CH1 & CH2 common-negative connection prohibited"	Common-negative connected to CH1&CH2 is prohibited
15XX	"Battery polarity reversed!"	Battery connected with polarity reversed.
16XX	"Internal control error"	Internal control checking error
17XX	"Exceed safe time limit"	Exceed safe time limit
18XX	"Exceed safe capacity limit"	Exceed safe capacity limit
19XX	"Exceed safe temperature range"	Exceed safe temperature range
20XX	"Output connection broken"	Output connection broken
21XX	"Balance port connection error"	Balance port connection error
22XX	"Low cell voltage detected on balance port"	Low cell voltage detected on balance port
23XX	"High cell voltage detected on balance port"	High cell voltage detected on balance port
24XX	"Voltage match error. Balance port sum is lower than output."	Voltage matched error, the voltage of balance port sum is lower than the one of output
25XX	"Voltage match error. Balance port sum is higher than output."	Voltage matched error, the voltage of balance port sum is higher than the one of output
26XX	"Number of cells doesn't match the setting"	Number of cells connected doesn't match the setting
27XX	"Number of cells setting appears low"	Number of cells setting appears low
28XX	"Number of cells setting appears high"	Number of cells setting appears high



29XX	"Balance not needed, Remove connection from balance port"	Balance port error, Ni-, Pb don't need balance port, but voltage of balance port is detected
30XX	"Balance required!"	Balance port is out plugged
31XX	"Auto detect the number of cells failed, please connect balance or set cells"	
32XX	"AD watchdog error"	AD watchdog error
33XX	"Synchronous mode: Channel outputs imbalance"	Channel outputs are imbalance in Synchronous mode
34XX	"This channel is needed to access the resistor or bulb load"	This regenerative channel is needed to access the resistor or bulb load
35XX	"The other channel is occupied"	The other channel is occupied