



Operating Instructions

CHARGERY 1010B

Synchronous Rectification and microprocessor controlled high performance rapid charger/discharger/balancer for NIMH/NICD, LI-ION, LIPO, LIFE and Lead Acid battery packs with cell balancer.

Charge current up to 10A, Discharge current up to 7A

1-10 Li-Ion/LiPo/LiFe, 1-27 NiMh/NiCd, 2-36V lead acid (Pb)



Chargery Power Co., Ltd.

Head Office

Add: Room 20B, Haihui Building, Nanhai Avenue, NanShan, ShenZhen, China

Zip code: 518054

Tel: +86 755 2643 6165

Fax: +86 755 2641 2865

Email: Jasonwang3a@163.com

Web: www.chargery.com

Welcome to the CHARGER 1010B intelligent balance charger designed especially for 1 to 10 Li-Ion, LiPo and LiFe cells, 1-27 NiMH/NiCd cells and 2 - 36V Lead acid(Pb) batteries. Please read the instructions carefully before using the charger.

Special Features

■ Built-in balancer for Li-Ion, LiPo and LiFe cells

The CY-1010B has a built-in individual cell balancer. Li-Ion/LiPo/LiFe batteries are automatically balanced during charging ensuring that when the battery is fully charged it is also properly balanced.

■ High power and high efficiency circuit

The CY-1010B has a maximum output power of 200W with up to 95% power conversion efficiency. The unit can charge or discharge up to 27 Cells of NiMH/NiCd and 1-10S Li-Ion/LiPo/LiFe cells at a maximum current of 10.0A. The automatic thermal management and efficient cooling system ensures that the charger can operate at full power without risk of overheating.

■ Synchronous Rectification

This advanced technology delivers up to 95% power transfer efficiency. This not only conserves power but also enables an especially compact design. Being only 140*98*25(mm) ensures that the charger is easy to take wherever it is needed. The CY-1010B delivers the full features and power of a high-end charger with the convenience of a field charger.

■ Dual confirmation of battery cell count

In addition to the user manually setting the cell count (displayed as "S"), the CY-1010B will identify the count automatically (displayed as "R"), and adjust the charging voltage and current automatically through comparing the "S" with "R".

■ Accept various types of lithium battery

The CY-1010B can support three types of lithium batteries -- lithium ion (LiIon), lithium polymer (LiPo) and lithium iron phosphate (LiFe). They have different electrochemical characteristics. You must select the correct chemistry before starting the charge or discharge process. For detailed information, please refer to the "**Warnings and safety abstract**".

■ Monitor individual cells on Charge/Fast Charge/Discharge/Storage/Cycle/Monitor mode

The CY-1010B also can monitor individual cells in the lithium battery pack when you connect the battery to the balance port. If the voltage of any cell varies abnormally, the process will be stopped automatically and an error message displayed.

■ **Unique Monitor mode for discharge with external load**

If the battery needs to be discharged at high current and the target discharge power exceeds the limit of the CY-1010B you can discharge the battery with an external load such as a lamp, resistor, motor etc. Choose the LI** MONITOR program to monitor and display the cell voltages, battery voltage, battery temperature and discharge time. In the event of any unexpected outcomes the CY-1010B will alarm and ensure that the cells/battery is not over discharged.

■ **Lithium battery "Fast" and "Storage" mode.**

"Fast" mode reduces the charging time, and the "Storage" mode controls the terminal voltage of the battery to be ready for long term storage.

■ **3 types of balance modes for Balance charge program**

There are 3 modes for terminating balance charges. The cell terminal voltage will be 4.19v in **NORMAL** mode, 4.20V for **SLOW** mode, and 4.18V for **FAST** mode. The trickle current during balance charging can be set. The CY-1010B will continue to charge at trickle current until the cell voltage reaches 4.18V/4.19V/4.20V, unless the battery is disconnected from the charger when the balance charge finished. The balance trickle can be set ON or OFF.

■ **Customized cell voltage during Cycle mode and Discharge mode**

When you cycle a lithium battery in charge-then-discharge mode or discharge-then-charge mode, you can set the terminal voltage of the charge or discharge. This allows you to charge or discharge a battery pack to any voltage for a special purpose. You can monitor the cell voltages and total charged or discharged capacity (mAh) during the cycle.

A flashing C or D will indicate whether the current cycle process is charge or discharge.

When you discharge the battery, the final voltage can be set up. This is very convenient for special purposes.

■ **Wider charging current range for 50~99900mAh battery**

You can set the charge current from **50 to 10000mA**. This means you can charge batteries down to 50mAh capacity at 1C while the CY-1010B ensures the current precision and battery safety.

■ **Customized process completion tone**

When any operation completes the beeper will alarm. The CY-1010B allows you to set the ring to one of 4 modes: Beep 3min/Beep 5times/Beep always (continuous)/Beep OFF

■ **Error message display and inspection**

In the case of an error being detected the LCD will display the possible cause. Press the STOP button to return back the main menu or press INC, DEC or START to check the final information displayed before alarming.

■ Perfect safety design

Process time limit

You can configure the process run time limit to prevent charge/discharge overrun due to any possible defect.

Battery temperature limit

The battery temperature will rise as a result of internal chemical reactions. The active process will be stopped automatically if the temperature reaches the configured limit.

Internal temperature limit

The CY-1010B monitors its internal temperature. When it is over 60°C, the charging power will be decreased to 150W (if charging). If it is over 65°C, the active process will be stopped automatically. Press STOP to return.

You can set the temperature units to °C or °F for your convenience.

Capacity charged or discharged limit

The capacity (mAh) is always calculated as the multiple of charge current and time. The charge or discharge process will be stopped automatically if the capacity reaches the configured limit.

Input power monitor

To protect the car battery (or other input power source) from being damaged the input voltage is always monitored. If it drops below the configured limit the active process will be stopped automatically.

When you use an AC adaptor/DC power supply as an input power source, if the input voltage is higher than the configured limit the active process will be stopped to protect the CY-1010B from being damaged.

Power limit

Maximum charge and discharge power can be configured. The CY-1010B can charge the battery with up to **99900**mAh capacity. When the unit charges or discharges the battery at 10A for a long time, it can monitor the internal temperature and automatically adjust the charge or discharge power. **The AUTO mode will adjust the charge power according to the input power automatically.**

■ Automatic cooling fan:

The electric cooling fan comes into action automatically only when the internal temperature of unit is over 40°C.

■ Delta-peak sensitivity:

The NiCd/NiMH automatic charge termination program works on the principle of the Delta-peak voltage detection.

■ Auto-charge current limit:

When charging NiCd or NiMH in "AUTO" current mode you can set the upper limit of charge current to avoid exceeding the cells' maximum rated charge current. It is very important when charging small capacity and low impedance NICKEL or NIMH battery in "AUTO" mode.

■ Data store/load:

For the user's convenience, the CY-1010B can store up to 10 sets of configuration data. You can store or reload the data at any time. The data contains the user settings and the battery charge/discharge/cycle settings.

■ Cyclic charging/discharging:

Perform 1 to 10 cycles of **charge>rest>discharge** or **discharge>rest>charge** continually for battery refreshing, resuming and balancing.

■ Brightly back-light LCD screen

The clear backlit LCD shows pack voltage, per-cell voltages, charge current, charge time, capacity charged (mAh), internal and external temperature, input voltage and more.

■ Light and attractive AL alloy case

The high-quality aluminum case is light, durable and a very efficient heat sink for cooling the electronics.

■ Protection function

- Reverse polarity and short circuit protection (input and output)
- Over-charge and over-current protection
- Detect an over-discharged battery and pre-charge the battery at a low current to restore the battery capacity
- If the LiXx battery voltage is less than 2V per cell the CY-1010B will refuse to charge to prevent from a potentially dangerous accident.

■ With Special Connector Conversion Board(CCB-ABC,CCB-AKT-XH, CCB-AKT-EH, CCB-AQP) and conversion wire (CEH-11) to fit all kinds of batteries with different balance connectors**■ Charge 3*3S, 3*2S, 2*5S battery packs simultaneously. The 3 or 2 packs should be connected to the CCB first and then connect the CCB to the CY-1010B.**

Warnings and safety abstract

Different electrochemical system rechargeable batteries have different charge and discharge characteristics, and different charging methods.

- Never leave the charger unattended when it is connected to its power supply. If any malfunction is observed immediately stop charging and refer to the instructions.
- Keep the unit away from dust, damp, rain, heat, direct sunshine and vibration. Do not drop it.
- The charger and the battery to be charged or discharged should be placed on a heat-resistant, non-inflammable and non-conductive surface. Never place them on a car seat, carpet or similar.
- Keep all inflammable volatile materials well away from the operating area.
- Be sure to fully understand the specifications of the battery to be charged or discharged. If the battery count is set up incorrectly the battery can be severely damaged and even cause a fire or explosion if overcharged.

NiMH / NiCd

- **Voltage level:** 1.2V/cell
- **Allowable fast charge current:** 1C – 2C depends on the performance of cell
- **Discharge voltage cut off:** 0.85V/cell(NiCd), 1.0V/cell(NiMH)

Li-Ion battery

- **Voltage level:** 3.6V/cell
- **Max. charge voltage:** 4.1V/cell
- **Allowable fast charge current:** 1C or less
- **Discharge terminal voltage:** 2.5V/cell or higher

LiPo battery

- **Voltage level:** 3.7V/cell
- **Max. charge voltage:** 4.2V/cell
- **Allowable fast charge current:** 1C or less
- **Discharge terminal voltage:** 3.0V/cell or higher

LiFe battery

- **Voltage level:** 3.3V/cell
- **Max. charge voltage:** 3.6V/cell
- **Allowable fast charge current:** 4C or less
- **Discharge terminal voltage:** 2.0V/cell or higher

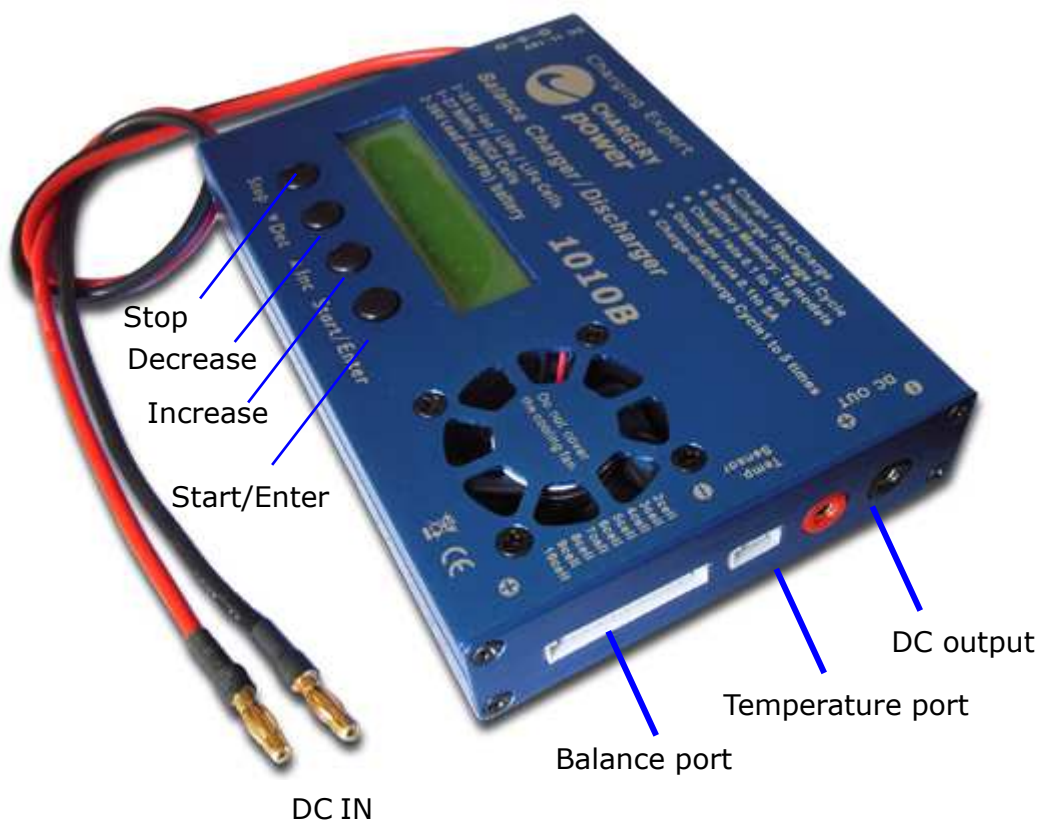
Lead Acid (VRLA, GEL, Pb) battery

- **Voltage level:** 2.0V/cell
- **Max. Charge voltage:** 2.46V/cell depends on the application and environment temperature.
- **Allowable fast charge current:** 0.5C or less
- **Discharge terminal voltage:** 1.75V/cell or higher

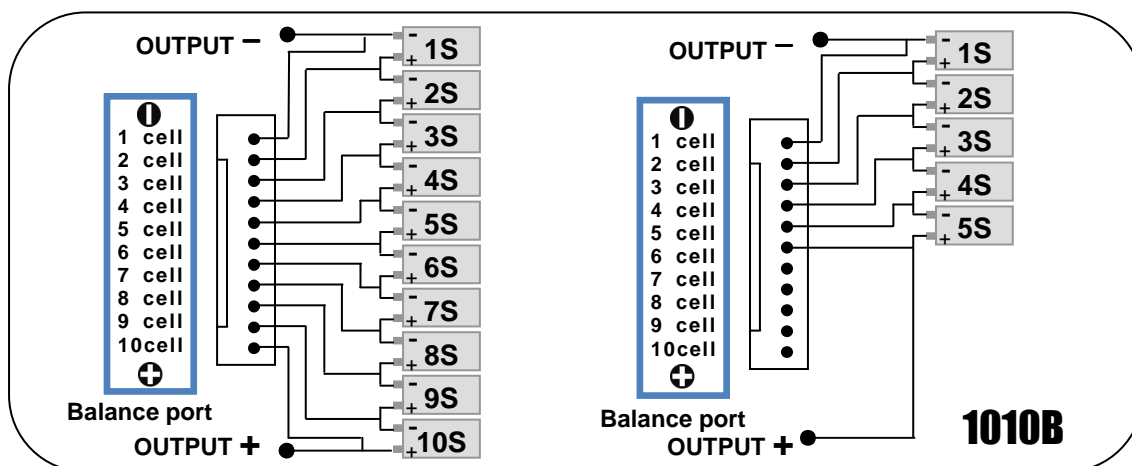
- Do not connect more than one battery pack to the charger output lead at any time unless using the CCB.
- Do not attempt to charge the following types of battery:
 - Battery pack which consists of different types of cell (including different manufacturers).
 - Battery which is already fully charged or just slightly discharged.
 - Non-rechargeable batteries (Explosion hazard).
 - Faulty or damaged battery.
 - Batteries with unconfirmed charging current
- Lithium battery packs can be composed of a mixture of parallel and series circuits. You have to [check the composition of the battery pack carefully before charging](#).
 - Are all connection firm and safe, or is there an intermittent contact at any point in the circuit?

These warnings and safety notes are particularly important. Please follow the instructions for maximum safety; otherwise the charger and/or the battery can be seriously damaged and could cause a fire or explosion leading to injury or loss of property.

Interface of the CY-1010B



Balance port and Individual Cell connection diagram:

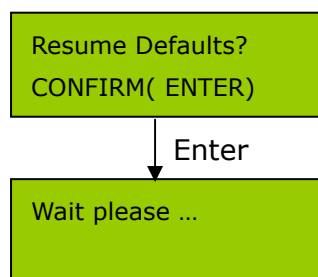


Testing mode

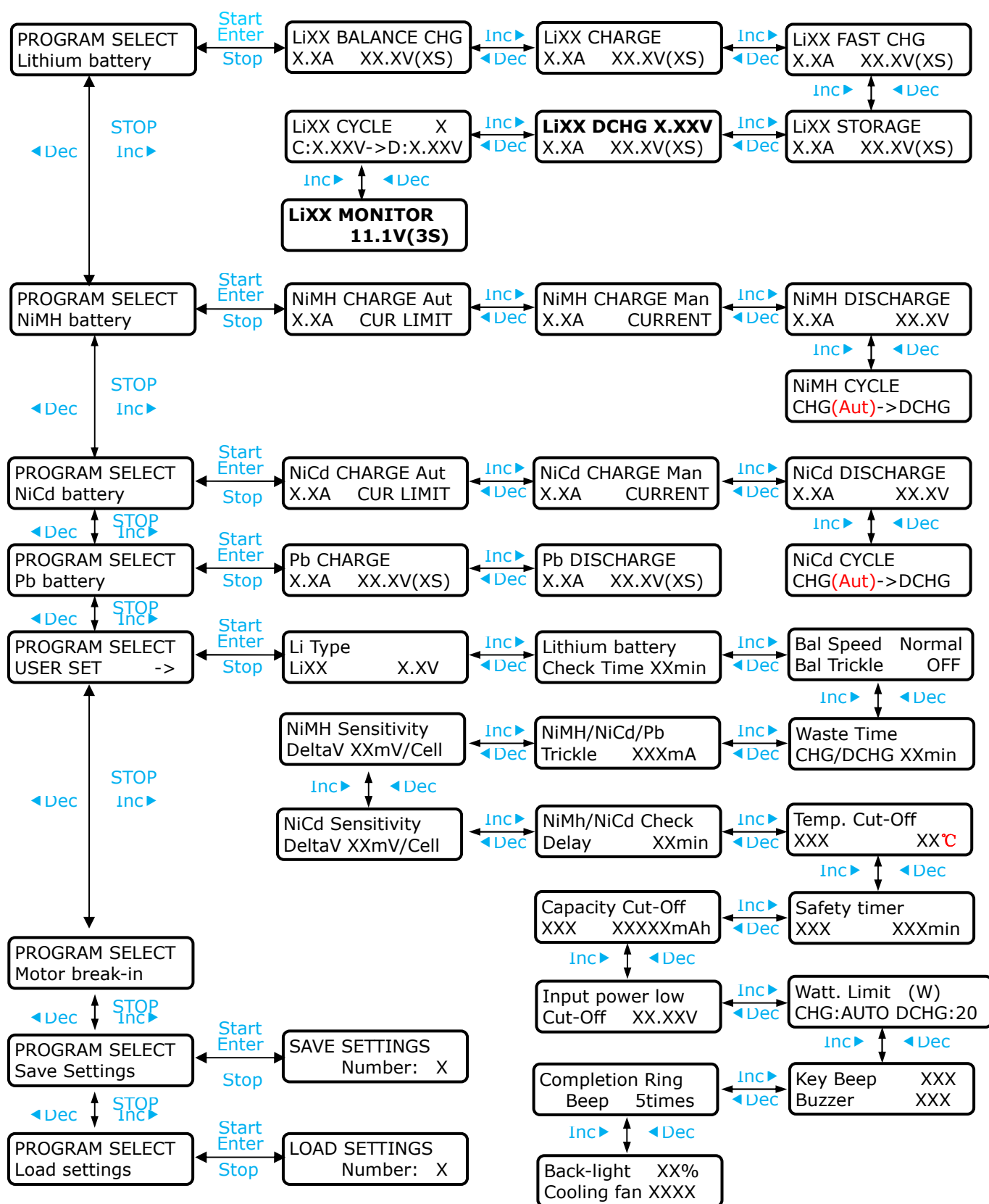
You can press the **STOP** button for 3 seconds to check all parameters before you conduct any operations; this feature can help you manage the DC power supply, charger User settings (many useful parameters) and the per-cell or battery voltage.

Resume all parameter defaults

You can press the **STOP** and **START/ENTER** buttons together for 3 seconds to resume all preset parameters before you conduct any operations.



Program flow chart

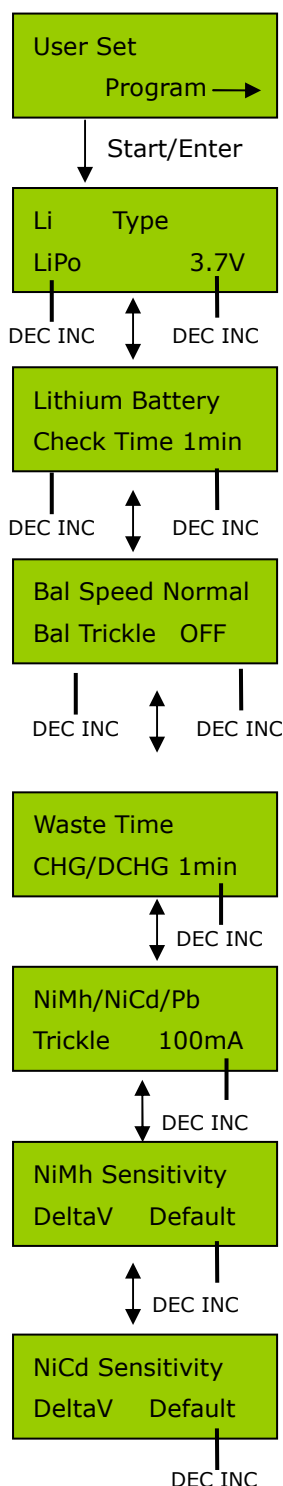


Note:

When you power off the CY-1010B it will remember the function being operated and start from that function when next turned on.

Initial parameter set up

CY-1010B will be operated with the default values for all User settings when it is connected to a 12V battery or an AC adapter for the first time. The LCD displays the following information in sequence and the user can change the parameter values at each step. When you want to alter a parameter value press the **Start/Enter** button to the value blink then change the value with the **DEC** or **INC** buttons. The new value will be saved by pressing the **Start/Enter** button again.



This is the start screen.

Before you charge a lithium ion battery pack, you must confirm the lithium type. **LiIo** is lithium ion battery with a nominal voltage of 3.6V/cell. **LiPo** is lithium polymer battery with a nominal voltage of 3.7V/cell. **LiFe** is lithium iron phosphate (LiFePO₄) battery with a nominal voltage of 3.3V/cell. It is very important, so you must check the battery carefully and set up correctly.

The 1010B identifies the cell count of lithium batteries automatically. Normally, 10 minutes of check time are enough to perceive the cell count correctly, the check time depends on the state of the charge of battery. If the charger identifies the cell count incorrectly at the beginning of the charge or discharge process, you may extend the time. Otherwise, you should use the default value.

There are 3 Balance speed settings. "NORMAL" will ensure the cell voltage reaches 4.19V, "SLOW" will ensure the cell voltage reaches 4.20V and "FAST" will ensure the cell voltage reaches 4.18V.

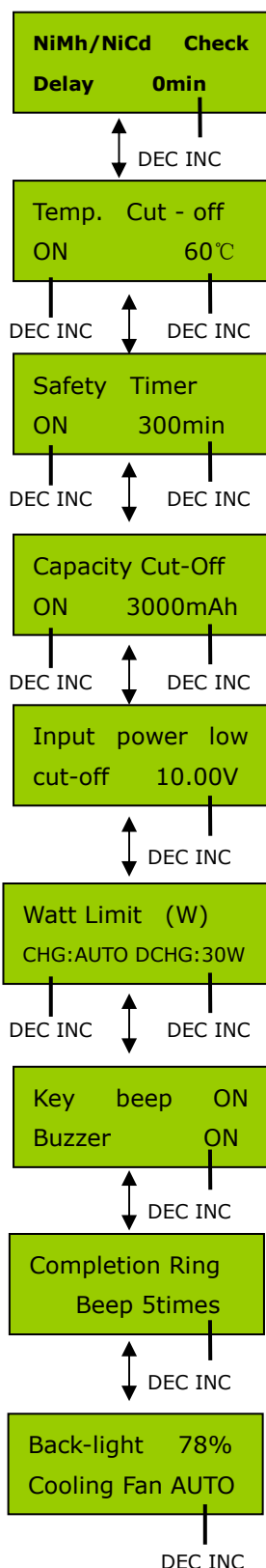
"Bal trickle" sets the trickle charge mode on or off. ON means to continue to charge at a tiny current after the balance charge is over, unless the battery is disconnected from the charger.

The battery can often be warm after charge or discharge. The program can set up an idle time to allow the battery to cool down before being subjected to the next process (charge or discharge). The time value ranges from 1 to 60 minutes.

For the NiMh / NiCd / Pb battery charge mode you can set the trickle charge current or turn it off. If it is on, the charger will automatically supply the trickle charge current to achieve the full charge without overheating the battery after fast charge has been terminated. The current value ranges from 10mA to 500mA. The default is OFF.

This menu shows the trigger voltage for automatic charge termination of NiMH and NiCd batteries. The effective value ranges from 3-20mv per cell. If the trigger voltage is set higher, there is a danger of overcharging the battery; if it is set lower, there is a possibility of premature termination. Please refer to the technical specification of the battery. **(NiCd default: 8mv, NiMH default: 4mv)**





This menu sets the delay time for monitoring the Delta V. Within the configured time the charger will not monitor the Delta V. This function can avoid the battery being stored for a long time is under charged.

An optional feature using a temperature probe in contact with the surface of the battery. The feature can be on or off. If it is on, set the maximum temperature the charger can allow the battery to reach during charging. If the battery temperature reaches the limit the charging will be ended to protect the battery. The maximum temperature is 80°C or 176 °F.

You can set the temperature unit to °C or °F.

When you start a charge process, the integral safety timer automatically starts running. This is programmed to prevent overcharge of the battery if it proves to be faulty or if the termination circuit can not detect the battery becoming fully charged. The value should be generous enough to allow a full charge of the battery. The maximum value is **999min**

This menu sets the maximum charge or discharge capacity during charge or discharge. If the termination circuit can not detect the battery fully charged or discharge termination, this feature will automatically stop charging or discharging at the set capacity value. The maximum capacity is **99900mAh**.

The charger monitors the voltage of the input power source. If the voltage drops below the value you set the charging process will be stopped automatically to protect it.

The charger monitors the charge power and discharge power. You can set the value to acquire the best result and highest efficiency. The maximum charge power is 200W and the maximum discharge power is 30w. **AUTO mode for charge power will adjust the charge power according to the input power automatically.**

The beep sounds for each button press to confirm your action. A beep or melody sounds at various times during operation to alert the user to mode changes. These sounds can be on or off.

This menu sets the beeper mode for the alarm that sounds after the active process completes. You can set 5 beeps, beep for 3min then stop, continuous beeps until the user presses STOP, or OFF.

This menu sets the brightness of LCD screen backlight.

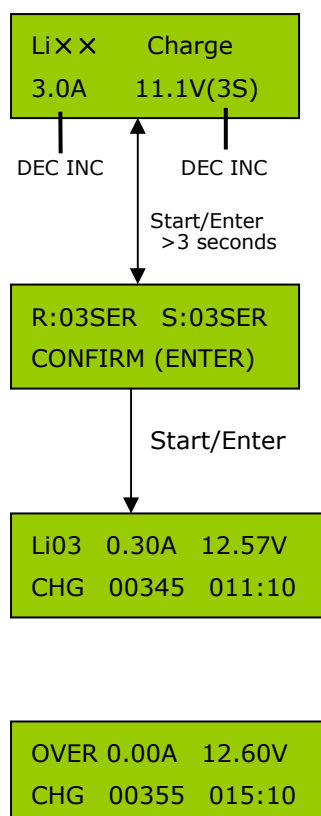
The Cooling fan has 3 modes, ON, OFF and AUTO. In AUTO mode it is intelligently controlled to start as needed based upon the internal temperature.

Lithium battery (LiIo/LiPo/LiFe) programs

These programs are only suitable for charging Lithium batteries with a nominal voltage of 3.6V/cell (lithium ion cell), 3.7V/cell (Lithium polymer cell) and 3.3V/cell (LiFePO4). This type of battery is charged using a constant current (CC) then constant voltage (CV) profile. The charge current is dependent on the battery capacity. Generally the charge current is less than 1C (the C is battery capacity, for example, if the capacity is 3000mAh, the charge current is less than 3000mA). The terminal voltage when full charged is very important, the charge current and nominal voltage for the configured cell count must always be correct for the battery to be charged.

Before charging you must set the Lithium type LiIo (3.6V), LiPo (3.7V) or LiFe (3.3V). You should connect the battery power leads to the output of charger. When you want to alter the parameter values, press the **START/ENTER** button to make it blink then change the value with **DEC** or **INC**. The new value will be saved by pressing **START/ENTER** once again.

Charge Lithium battery in CHARGE mode



The left side of the first line shows the type of battery you selected in the User settings. The values on the second line set the charge current and the voltage (cell count) of the battery pack. Press **START/ENTER** to make the value flash then press **DEC** or **INC** to adjust the value. After setting the current and voltage press **START/ENTER** again for more than 3 seconds to start the process. (Charge current: 0.05~10.0A, Voltage: 1~10 series)

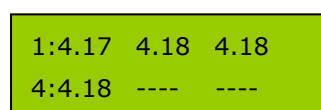
This screen shows the cell count. 'S' is the value set up by you at the previous screen and 'R' shows the cell count detected by the charger. If both counts are identical you can start charging by pressing **START/ENTER**. If not, press **STOP** to go back to the previous screen. Then carefully check the battery nominal voltage to charge again.

This screen shows the status during charging. **Li3S means the battery pack is being charged as 3 cells in series even the cell count you selected is not 3. Li03 and LiXx are displayed in turn. It indicates the battery type and cell count.** On the top line it shows cell count, charging current and battery voltage from left to right. While the bottom line shows Charge (CHG), capacity charged (mAh) and charging time.

To stop the charge, press **STOP**.

The battery is fully charged.

If the battery is connected to the balance port, you can monitor the voltage of individual cells by pressing **INC** during the process.



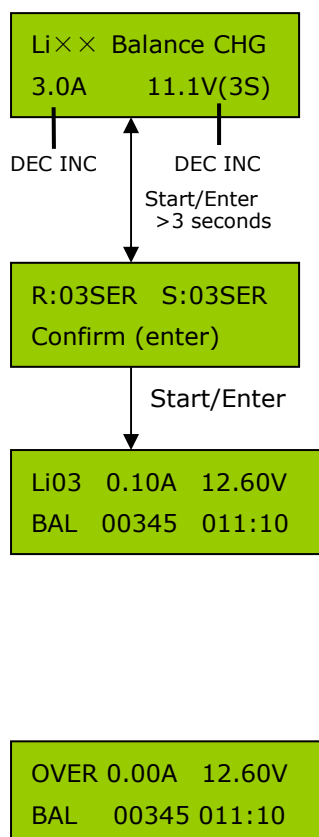
The first line shows the voltages of cells 1, 2 and 3 from the left. The second line shows the voltages of cells 4, 5 and 6. Press **INC** again for the second screen with cells 7 to 10.

You can also check the parameters you configured in the USER SET PROGRAM by pressing **DEC**. This includes end voltage, safety timer, capacity limit, temperature limit, external and internal temperature, and input voltage limit.

Charge Lithium battery in BALANCE CHARGE mode

This is for balancing the cell voltages of the battery pack to be charged. To do this, the battery pack should have the balance lead connected to the balance port at the right side of charger. At the same time, the battery power leads should be connected to the output of the charger.

In this mode, the charging process will be different from ordinary charging mode. The built-in balancer will monitor the voltage of each cell of the battery pack and adjust the charge current feeding to each cell to balance the voltage.



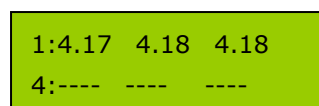
The values on the second line set the charge current and the voltage (cell count) of the battery pack. Press **START/ENTER** to make the value flash then press **DEC** or **INC** to adjust the value. After setting the current and voltage press **START/ENTER** again for more than 3 seconds to start the process. (Charge current: 0.05~10.0A, Voltage: 1~10 series)

This screen shows the cell count. 'S' is the value set by you at the previous screen and 'R' shows the cell count detected by the charger. If both counts are identical you can start charging by pressing **START/ENTER**. If not, press **STOP** to go back to the previous screen. Then carefully check the battery nominal voltage to charge again.

The screen shows the status during the charge process. **Li03** means the battery pack charged is 3 cells in series even if the cell count you selected is not 3. **Li03** and **Li××** are displayed in turn. It indicates battery type and cell count. On the top line, it shows cell count, charging current and battery voltage from left to right. While the bottom line shows Balance Charge (BAL), capacity charged (mAh) and charging time. To stop the charge, press **STOP**.

The battery is fully charged and balanced.

You can monitor the voltage of individual cells by pressing **INC** during the process.



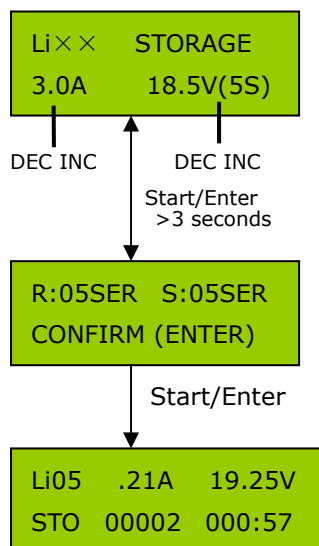
The first line shows the voltages of cells 1, 2 and 3 from the left. The second line shows the voltages of cells 4, 5 and 6. Press **INC** again for the second page with cells 7 to 10.

You can also check the parameters you configured in the USER SET PROGRAM by pressing **DEC**. This includes end voltage, safety timer, capacity limit, temperature limit, external and internal temperature, and input voltage limit.

Lithium battery (LiIo/LiPo/LiFe) in STORAGE mode

This is for storage of the pack to be charged or discharged. To do this, the battery pack should connect to the DC OUT, the unit will determine to charge or discharge the battery pack to the certain voltage depending on the initial voltage of the battery. The storage voltage depends on the type of the battery: 3.75V/cell for LiIo, 3.85V/cell for LiPo and 3.3V/cell for LiFe.

If the battery pack is also connected to the balance port the charger will monitor the cell voltages.

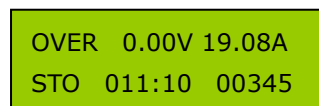


You can set the current and the voltage of the battery pack to be stored. The current will be used for charging or discharging the battery to reach the "storage" voltage.

This screen shows the cell count. 'S' is the value set by you at the previous screen and 'R' shows the cell count detected by the charger. If both counts are identical you can start the process by pressing **START/ENTER**. If not, press **STOP** to go back to the previous screen. Then carefully check the battery nominal voltage to do again.

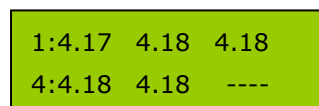
This screen shows the status during the process. **Li05 means the battery pack is 5 cells in series even if the cell count you set is not 5. Li05 and Li x x are displayed in turn. It indicates battery type and cell count.** On the top line, it shows cell count, charge/discharge current and battery voltage from left to right. On the bottom line it shows Storage (STO), capacity charged or discharged (mAh) and process time.

To stop the process, press **STOP**.



The battery is in storage status.

If the battery is connected to the balance port you can monitor the voltage of individual cells by pressing **INC** during the process.

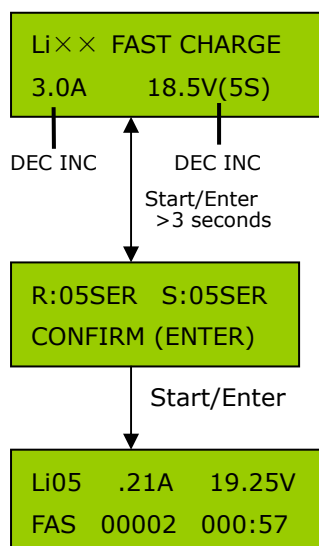


The first line shows the voltages of cells 1, 2 and 3 from the left. The second line shows the voltages of cells 4, 5 and 6. Press **INC** again for the second page with cells 7 to 10.

You can also check the parameters you configured in the USER SET PROGRAM by pressing **DEC**. This includes end voltage, safety timer, capacity limit, temperature limit, external and internal temperature, and input voltage limit.

Charge Lithium battery in FAST CHARGE mode

The charging current is reduced as the CV phase progresses. If the terminating charge current is bigger than for normal charging the charging process will end sooner. The capacity charged may be a bit smaller than normal charging but the process time will be reduced. If the battery pack is also connected to the balance port then the charger will monitor the cell voltages.



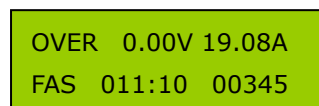
The values on the second line set the charge current and the voltage (cell count) of the battery pack. Press **START/ENTER** to make the value flash then press **DEC** or **INC** to adjust the value. After setting the current and voltage press **START/ENTER** again for more than 3 seconds to start the process. (Charge current: 0.05~10.0A, Voltage: 1~10 series)

This screen shows the cell count. 'S' is the value set by you at the previous screen and 'R' shows the cell count detected by the charger. If both counts are identical you can start charging by pressing **START/ENTER**. If not, press **STOP** to go back to the previous screen. Then carefully check the battery nominal voltage to charge again.

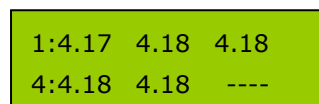
This screen shows the status during the process. **Li05 means the battery pack is 5 cells in series even if the cell count you set is not 5. Li05 and LiX are displayed in turn. It indicates battery type and cell count.** On the top line, it shows cell count, charge/discharge current and battery voltage from left to right. On the bottom line it shows Storage (STO), capacity charged or discharged (mAh) and process time.

To stop the process, press **STOP**.

The Fast charge process is over.



If the battery is connected to the balance port you can monitor the voltage of individual cells by pressing **INC** during the process.



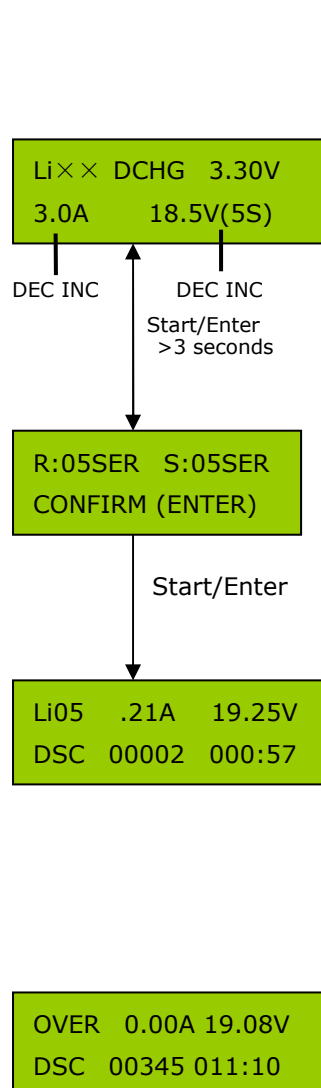
The first line shows the voltages of cells 1, 2 and 3 from the left. The second line shows the voltages of cells 4, 5 and 6. Press **INC** again for the second page with cells 7 to 10.

You can also check the parameters you configured in the USER SET PROGRAM by pressing **DEC**. This includes end voltage, safety timer, capacity limit, temperature limit, external and internal temperature, and input voltage limit.

Discharge Lithium battery in DISCHARGE mode

To discharge a Lithium battery connects the pack the charger's DC OUT terminals. The charger will discharge the battery pack to the terminal voltage. If the battery pack is connected to the balance port the charger will monitor the cell voltages.

The terminal voltage depends on the battery type. Please refer "**Warnings and safety abstract**".



On the right of the top line, you can set up the terminal voltage of the cell, so you can discharge the battery to a voltage you want for a special purpose.

The value on the second line sets a discharge current and the cell count and voltage of the battery pack.

Press **START/ENTER** to make the value flash then press **DEC** or **INC** to adjust the value. After setting the current and voltage press **START/ENTER** again for more than 3 seconds to start the process. (Discharge current: 0.05~7.0A, Voltage: 1~10 series)

This screen shows the cell count. 'S' is the value set by you at the previous screen and 'R' shows the cell count detected by the charger. If both counts are identical you can start discharging by pressing **START/ENTER**. If not, press **STOP** to go back to the previous screen. Then carefully check the battery nominal voltage to discharge again.

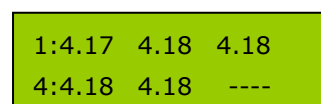
This screen shows the status during the process. **Li05 means the battery pack is 5 cells in series even if the cell count you set is not 5. Li05 and LiXx are displayed in turn. It indicates battery type and cell count.** On the top line, it shows cell count, discharge current and battery voltage from left to right. On the bottom line it shows Discharge (DSC), capacity discharged (mAh) and process time.

During the process, your can press **ENTER** to make current blink and then press **INC** or **DEC** to change the discharge current then press **ENTER** again to store the new value.

To stop the preocess, press **STOP**.

The discharging process is over.

If the battery is connected to the balance port you can monitor the voltage of individual cells by pressing **INC** during the process.



The first line shows the voltages of cells 1, 2 and 3 from the left. The second line shows the voltages of cells 4, 5 and 6. Press **INC** again for the second page with cells 7 to 10.

You can also check the parameters you configured in the USER SET PROGRAM by pressing **DEC**. This includes end voltage, safety timer, capacity limit, temperature limit, external and internal temperature, and input voltage limit.

Lithium battery (LiIo/LiPo/LiFe) in CYCLE mode

This program is to refresh or restore the battery capacity. There are 2 modes, charge-then-discharge and discharge-then-charge. To do this connects the pack the charger's DC OUT terminals. If the battery pack is connected to the balance port the charger will monitor the cell voltages.

You need set the waste (idle) time between charge and discharge to cool down the battery.

```
LiXx CYCLE 2
C:4.15V -->D:2.50V
```

DEC INC

DEC INC

Start/Enter
>3 seconds

```
R:05SER S:05SER
CONFIRM (ENTER)
```

Start/Enter

```
Li05 .21A 19.25V
C>D 00002 000:57
```

```
OVER 0.00A 19.08V
C>D 00345 011:10
```

```
1:4.17 4.18 4.18
4:4.18 4.18 ----
```

```
DCHG 1 2005mAh
CHG 1 2260mAh
```

On the right of first line, you can set the number of cycles. The values on the second line set the cycle sequence and **terminal voltage when charging or discharging**.

The terminal voltage is per cell which allows you to charge or discharge the battery pack to any voltage.

Press **START/ENTER** then press **DEC** or **INC** to change the value. After setting press **START/ENTER** for more than 3 seconds to start the process. You can use this function for balancing, refreshing and breaking-in a battery. To avoid over-heating the battery there will be a brief cool-off period that set up at 'USER SET PROGRAM'.

This screen shows the cell count. 'S' is the value set by you at the previous screen and 'R' shows the cell count detected by the charger. If both counts are identical you can start Charging by pressing **START/ENTER**. If not, press **STOP** to go back to the previous screen. Then carefully check the battery nominal voltage to cycle again.

This screen shows the status during the process. **Li05 means the battery pack is 5 cells in series even if the cell count you set is not 5. Li05 and LiXx are displayed in turn. It indicates battery type and cell count.** On the top line, it shows cell count, current and battery voltage from left to right. On the bottom line it shows the cycle mode (C>D or D>C), capacity charged or discharged (mAh) and cycle time. **The flashing C or D indicates the current process---charge or discharge.** The Charging current is accordance with the current set up in the "LI** CHARGE", and the discharging current is as same as the current set up in the "LI** discharge".

The Cycle process is over.

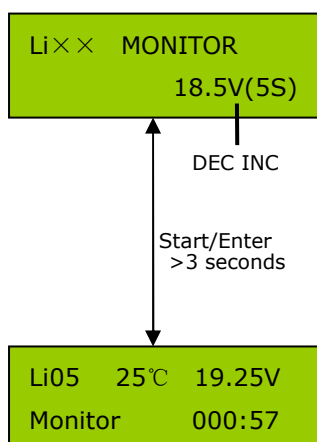
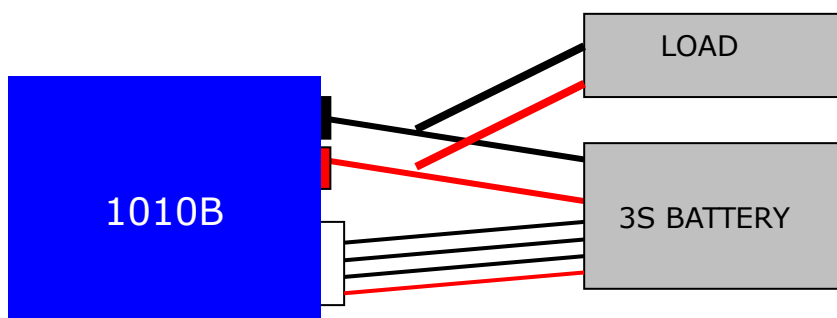
During the process, press **INC** to see the capacity charged or discharged at each cycle process. if you connect the battery to the balance port, you can monitor the cell voltages at the same time

You can also check the parameters you configured in the USER SET PROGRAM by pressing **DEC**. This includes end voltage, safety timer, capacity limit, temperature limit, external and internal temperature, and input voltage limit.

MONITOR Lithium cell (LiIo/LiPo/LiFe) voltage when discharging with external loads

The program is to monitor the cell voltages and alarm when the battery is discharged with external loads. This function will protect any cell from being over discharged. You can use any loads such as lamps, resistors or others and not worry that any cell or the battery overall will be over discharged.

To do this, you must connect the battery to the balance port on the charger, at the same time, the battery discharge leads must be connected to the DC out port of the charger and to the external load. The connection diagram is as below (using a 3S battery as an example).

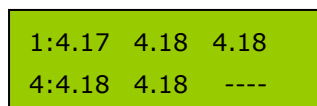


The program is to monitor the cell voltages when the battery pack is discharged with external loads. You can set the battery voltage or cell count

The screen shows the status during discharge. **Li05 and li x x are displayed in turn. It indicates battery type and cell count.** On the top line battery temperature and battery voltage are shown from left to right. On the bottom line the monitoring time is shown.

If you press **STOP** the charger will stop monitoring the cell voltages.

When you disconnect the battery and loads the charger continues to monitor the battery state, if you continue to discharge, please press **START** to monitor again.



During the process, press **INC** or **DEC** to see the cell voltages. When any cell is over discharged, the charger will alarm.

During the process, when the battery temperature, battery voltage, cell voltage or the process time reaches the configured limit, the charger will alarm.

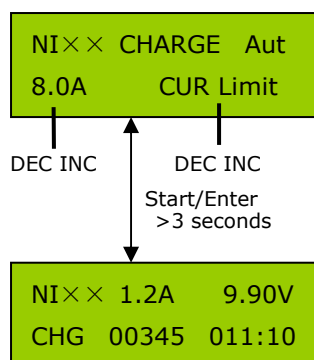
NiMH/NiCd battery program

These programs are for charging or discharging NiMH (Nickel-Metal-Hydride) or NiCd (Nickel-Cadmium) batteries commonly used for R/C model applications.

To alter the displayed value press the START/ENTER button to make it blink then change the value using the INC and DEC buttons. Store the new value by pressing the START/ENTER button again.

To start the process press the START/ENTER button for more than 3 seconds.

NiMH/NiCd charging in **Automatic** mode



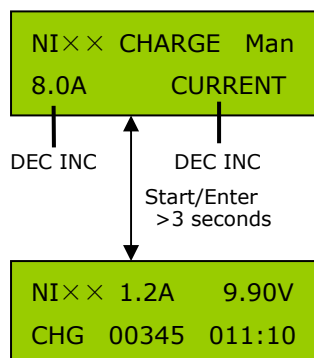
In the "Aut" mode the 1010B charges the battery at about 1C but at no more than the maximum current you set on the second line.

(Charge current range: 0.05~10.0A)

The screen shows the status during charging. To stop the charge press **STOP**. The top line shows the charging current and battery voltage from left to right. On the bottom line it shows Charge (CHG), capacity charged (mAh) and charging time.

When the process is over the process completion tone is sounded.

NiMH/NiCd charging in **Manual** mode



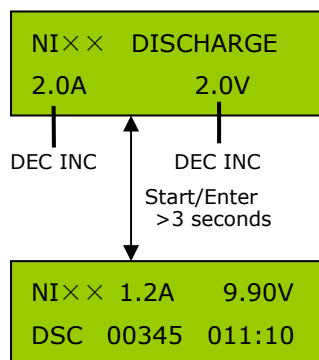
In "Man" mode the 1010B charges the battery using the current you set on the second line.

(Charge current: 0.05~10.0A)

The screen shows the status during charging. To stop the charge press **STOP**. The top line shows the charging current and battery voltage from left to right. On the bottom line it shows Charge (CHG), capacity charged (mAh) and charging time.

When the process is over the process completion tone is sounded.

NiMh/NiCd battery **Discharge** mode



The value on the second line sets the discharge current and the terminal voltage of the battery pack.

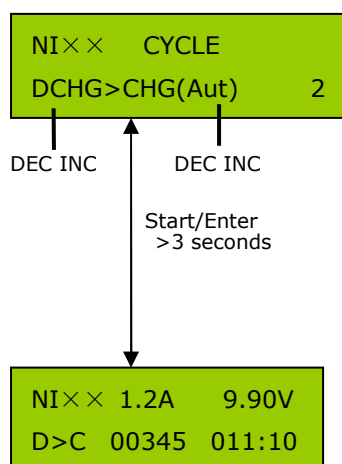
Discharge current is from 0.05~7.0A, the terminal Voltage is from 0.1~40V

The screen shows the status during discharging. To stop the discharge press **STOP**. The top line shows the discharging current and battery voltage from left to right. On the bottom line it shows Discharge (DSC), capacity discharged (mAh) and discharging time.

During the process you can press **ENTER** to make current blink and then press **INC** or **DEC** to change the discharge current. Press **ENTER** again to confirm.

When the process is over the process completion tone is sounded.

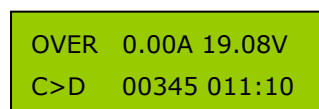
NiMh/NiCd battery **Cycle** mode



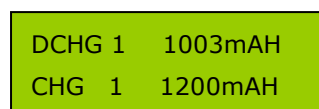
Set the charge and discharge sequence on the left and the number of cycles on the right. Set the charge current in the Man or Aut mode menu and the discharge current in the Dsc mode menu.

You can use this function for breaking-in, balancing or refreshing the battery. To avoid overheating the battery there will be a brief cool-off period after each charge/discharge phase. The Wait time is set in the 'USER SET PROGRAM' menu.

The screen shows the status during cycling process. The top line shows current and battery voltage from left to right. The bottom line shows the cycle mode (C>D or D>C), capacity charged or discharged (mAh) and cycle time. **The flashing C or D indicates the current process: charge or discharge.** You set the Charging current in the "NI** CHARGE Man" or "NI ** CHARGE Aut" menu and the discharging current in the "NI** DISCHARGE " menu.



The Cycle process is over.

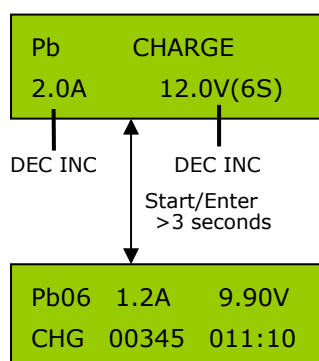


During the process, press **INC** to see the charged or discharged capacity of the battery at each cycle process.

Lead acid (Pb) battery charge mode

This program is for charging Pb (lead-acid) batteries with nominal voltages from 2 to 36V. Lead acid battery or VRLA, Gel batteries are totally different from NiCd or NiMH batteries. They can only deliver relatively lower current compared to their capacity and charging can only be done at relatively low rates compared to other chemistries. The optimal charge current is 0.1C. This type of battery must not be charged rapidly. Always follow the instructions supplied by the battery manufacturer.

To alter a parameter value, press START/ENTER to make it blink then change the value with INC or DEC. Store the value by pressing START/ENTER key again.



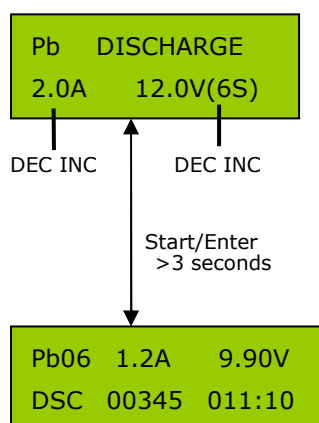
Set the charge current and the nominal voltage of the battery. The charge current range is 0.05~10.0A and should be set to 0.1C for the battery to be charged. The voltage should be matched to the nominal voltage of the battery to be charged. The voltage parameter range is 2-36V.

The screen shows the status during the charge process. The top line shows the cell count, charging current and battery voltage from left to right. The bottom line shows Charge (CHG), capacity charged (mAh) and charging time.

To stop the charge, press **STOP**.

When the process is over the process completion tone is sounded.

Lead acid(Pb) battery discharge mode



Set the discharge current and the nominal voltage of the battery. The discharge current ranges from 0.05 to 7.0A. The voltage should be matched to the nominal voltage of the battery to be discharged. The nominal voltage range is 2-36V.

The screen shows the status during discharge process.

The top line shows the cell count, discharging current and battery voltage from left to right. The bottom line shows discharge (DSC), capacity discharged (mAh) and discharging time.

During the process, you can press **ENTER** to make the current blink and then press **INC** or **DEC** to change the value. Press **ENTER** once again to confirm.

To stop the discharge press **STOP**.

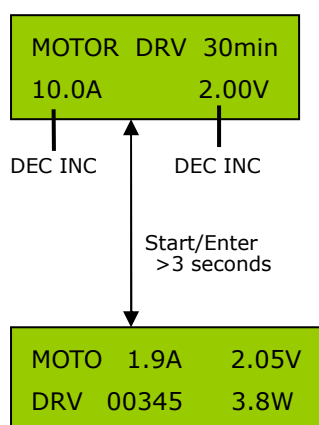
When the process is over the process completion tone is sounded.

Motor Break-in program

You can easily break-in new **brushed** electric motors with a variable voltage and running time.

Note that brushless motors do not require or benefit from a breaking-in process.

With this program you can also check the motor output power to optimize your power train set up. The break-in process is essential for maximizing the power of a new brushed motor. New motors have square brushes which press up against the curved commutator. The goal of the break-in process is to gently shape the brushes so that they develop a curved surface that fits snugly against the commutator giving a greater conducting surface area and hence lower losses and higher efficiency.



Connect the motor to the DC OUT. Set up the testing time, maximum current limit and the drive voltage. To start the motor run press **START/ENTER** for more than 3 seconds. (Time is 1 to 90min, limit current is 0.1-10A, voltage is 1-15V.)

The screen shows the status during the motor run process.

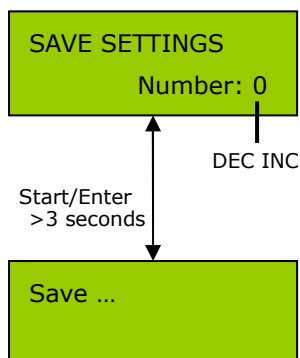
The top line shows the operating current and driving voltage from left to right. The bottom line shows the consumption capacity (mAh), output power or time.

To stop the process, press **STOP** once.

Save settings

The CY-1010B has a settings storage and load program for your convenience. This feature can store up to 10 datasets by number. Each dataset represents the individual setup for a particular set of batteries. Datasets can be reloaded for charging or discharging without having to reconfigure all the parameters again.

To set parameter value in the program, press the START/ENTER button to make it blink then change the value with the INC and DEC buttons.



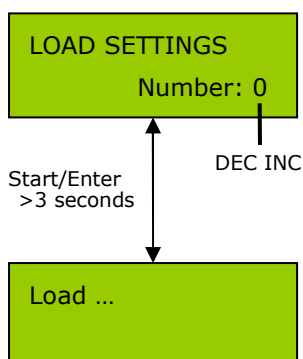
The value on the second line sets the memory location in which to store the dataset. This includes the settings for all programs and all the User settings for all chemistries. (Memory locations are in the range: 0 ~ 9)

The screen shows the status of the save process. When the process is over it will automatically return to the previous screen.

Load settings

You can easily restore any one of the ten available datasets stored in the CY-1010B.

To set a parameter value in the program, press the START/ENTER buttons to make it blink then change the value with the INC and DEC buttons.



The value on the second line sets the memory location from which to load the settings. This includes the settings for all programs and all the User settings for all chemistries. (Memory locations are in the range: 0 ~ 9)

The screen shows the status of the load process. When the process is over, the charger will automatically go to the previous screen.

Warning and error messages

The CY-1010B has a wide range of protection and alarm functions to monitor the operation of charger. In the case of any error occurring the LCD will display the possible cause. **Press the STOP button to return, press INC, DEC or START to check the final information displayed before alarming.**

REVERSE POLARITY CHECK CONNECTION	The battery pack is connected in reverse.
SHORT ERROR BREAK DOWN	The DC output leads are short-circuited.
CONNECTION BREAK DOWN	This will be displayed in case of detecting an interruption of the connection between the battery and the charger.
INPUT VOLTAGE LOW VOLTAGE	The input voltage is under the limit value set in the USER SET PROGRAM.
INPUT VOLTAGE OVER VOLTAGE	The input voltage is over 18V.
BALANCE PORT CELL LOW VOL	Using the Balance port, the cell count detected by the charger is less than that of the user setting.
BALANCE PORT CELL HIGH VOL	Using the Balance port, the cell count detected by the charger is larger than that of the user setting.
BALANCE PORT NOT CONNECTION	In Balance charge mode, no battery is connected to the balance port.
BATTERY CHECK LOW VOLTAGE	Without using the balance port, the cell count detected by the charger is less than that of the user setting.
BATTERY CHECK OVER VOLTAGE	Without using the balance port, the cell count detected by the charger is larger than that of the user setting.
Int. TEMP OVER BREAK DOWN	The internal temperature is over 65°C.
Ext. TEMP OVER BREAK DOWN	The external temperature (battery temp.) reached the limit.
CAPACITY OVER BREAK DOWN	The capacity charged or discharged reached the limit.
SAFETY TIME OVER BREAK DOWN	The charge or discharge time reached the limit.

Specifications

■ Supported battery types:	Li-Ion/LiPo/LiFe, NiMH/NiCd, Pb
■ Battery count:	1~10 Li-Ion/LiPo and LiFe, 1-27 NiMH/NiCd, and 2-36V Pb
■ Battery capacity:	50~99900mAH
■ Input voltage:	DC 11-18V, 20A
■ Charge power:	MAX. 200W
■ Charge current:	0.05~10A
■ Discharge power:	30W
■ Discharge current:	0.05~7A
■ Balancing current:	300mA/cell
■ Dimensions:	140*98*25mm
■ Weight:	580g

Accessories below coming with the charger as **standard** parts

CW1 , Output leads, 4mm gold banana to alligator clips	CW2 , input leads, DC coaxial female to Alligator.	CEH-11 Conversion Wire for balance charge
		

The accessories below as **optional** parts

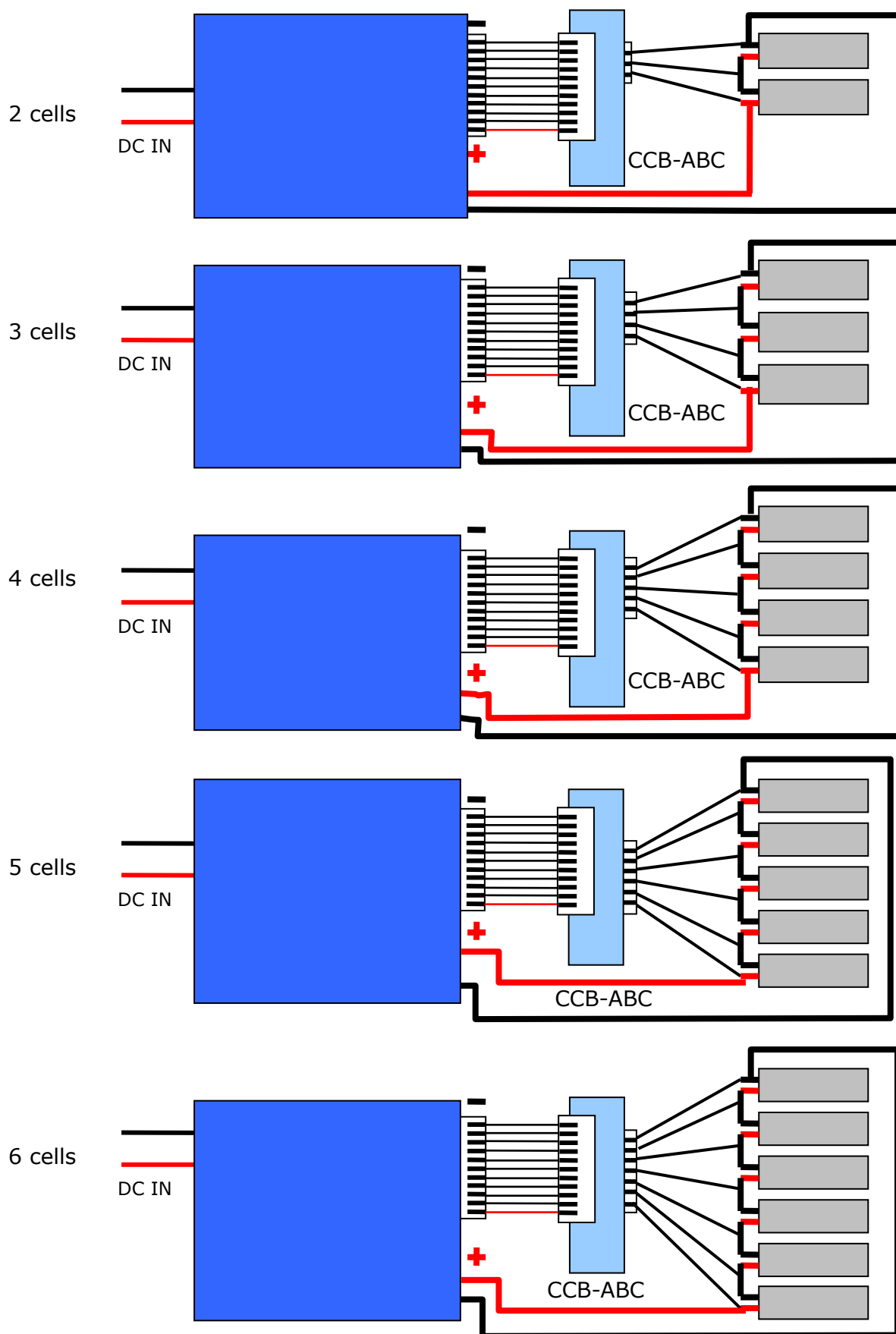
CCB-ABC for 3*2S, 3*2S 4S, 5S, 6S, 7S, 8S, 9S, and 10S Flight power and Thunder power lipo battery pack		
		
CCB-AKT-XH for 2S to 6S, 3*2S, 3*3S, 2* 4S, 2*5S Align / Dualsky battery pack	CCB-AKT-EH for 2S to 6S, 3*2S, 3*3S, 2* 4S, 2*5S Kokam/Graupner battery pack	CCB-AQP for 2S to 6S, 3*2S, 3*3S, 2* 4S, 2*5S Polyquest/Hyperion battery pack
		

CW15 , Special Alligator with 4mm gold banana jack.	CW11 , input leads, Coaxial female plug to 4mm banana male connector	CW9 , Temperature Sensor.
		
CW5 , Output leads 4mm gold banana to JST	CW3 , Output leads 4mm gold banana to Deans	CW4 , Output leads 4mm gold banana to Tamiya
		

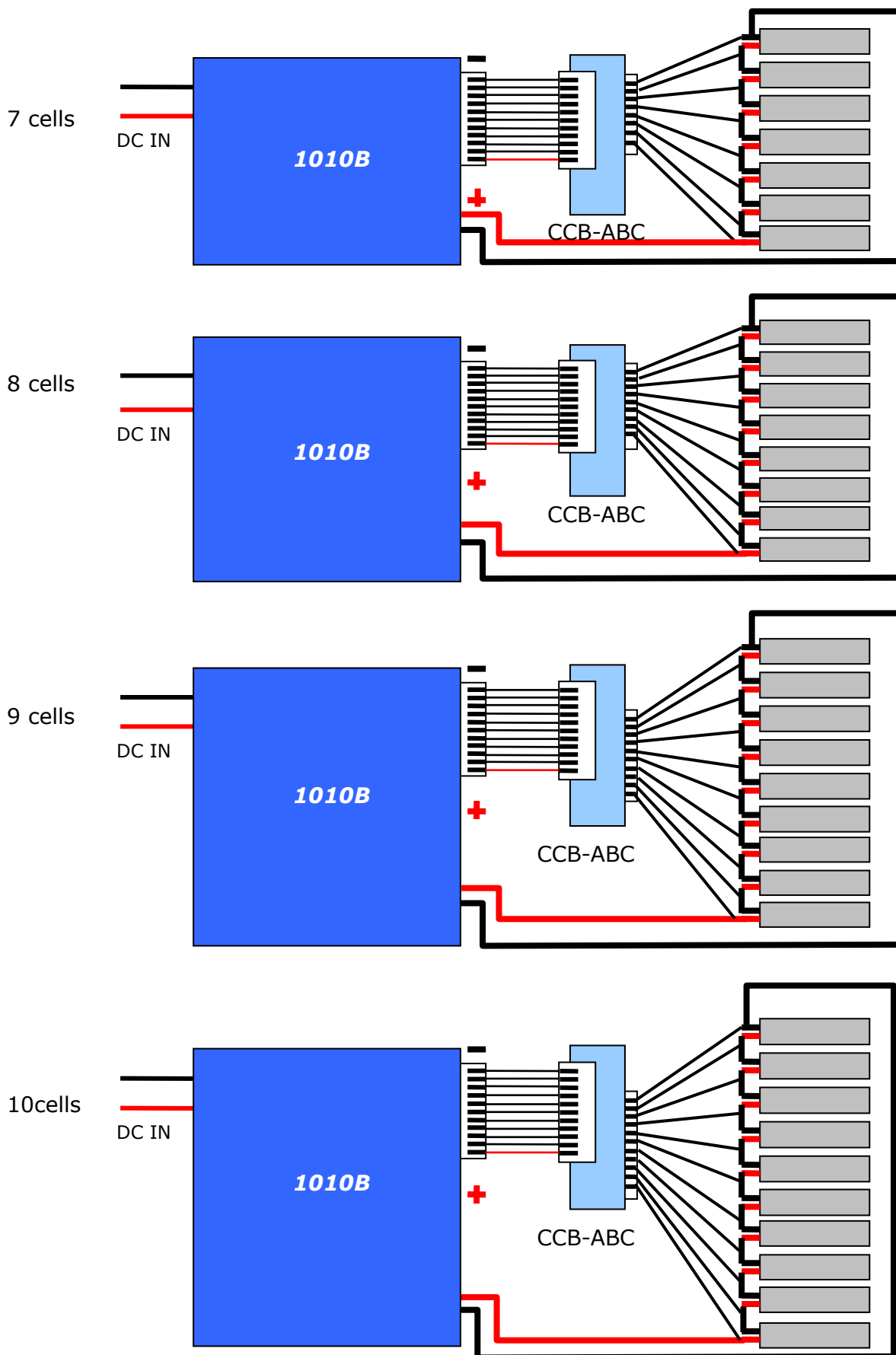
Warranty and Service

Chargery Power Co., Ltd. as manufacture of R/C model power warrants its CHARGER charger and battery pack to be free of defects in material and workmanship. This warranty is effective for 18 months from date of purchase. If within the warranty period the customer is not satisfied with the products performance resulting from a manufacturing defect the accessory will be replaced or repaired. This warranty does not cover the damage due to wear, overloading, incompetent handling or using of incorrect accessories.

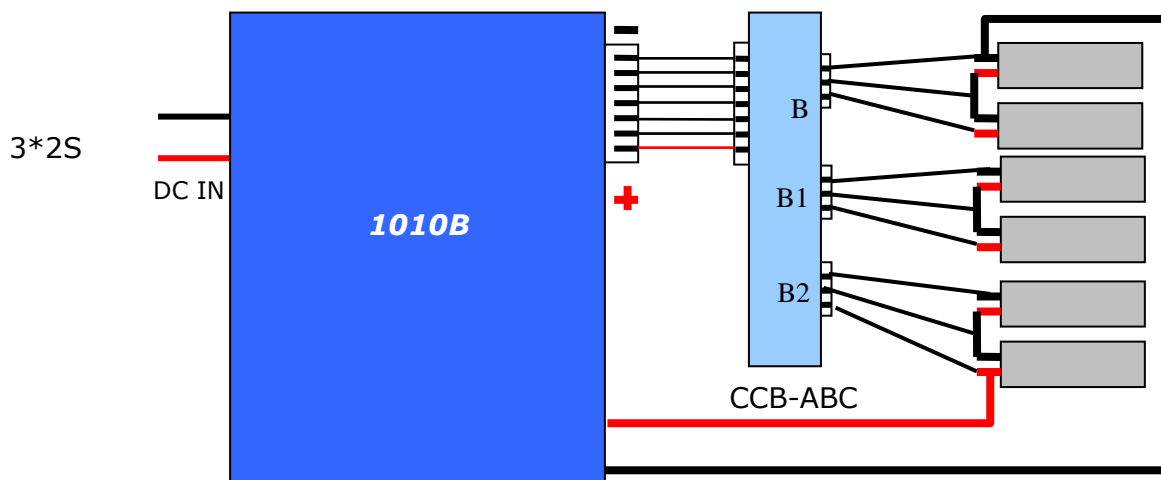
Balance Connection Diagram



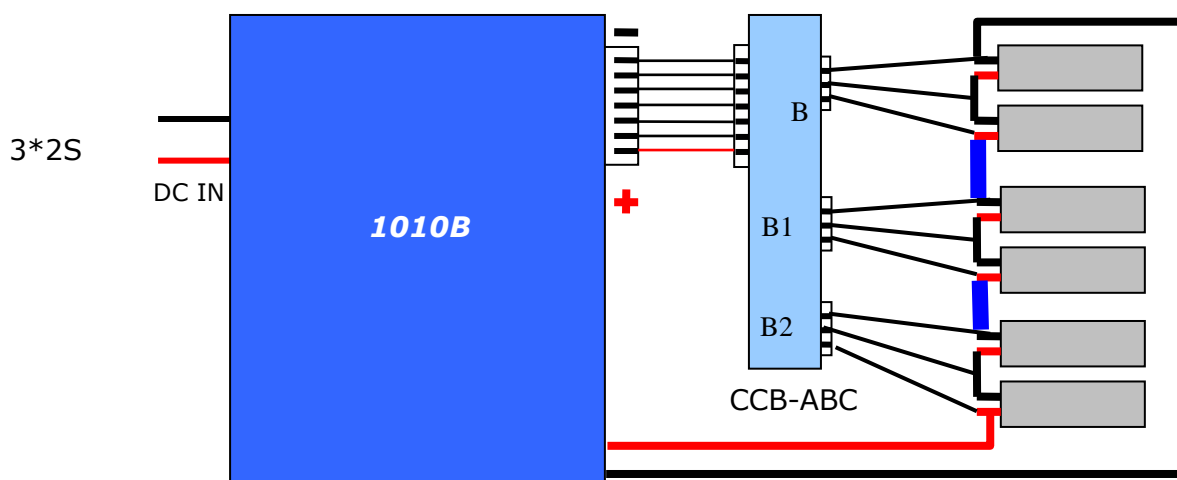
Balance Port Connection Diagram



Balance Charge 3*2S or 3*3S battery packs, Please note the batteries being charged should all have the same nominal capacity (mAh).



Charging Current < 3A



Blue wires are to connect 3*2S packs in series for over 3A current

Charging Current > 3A

Maximum circuit power chart

When the battery voltage is more than 20V, the actual charging current delivered to the battery will be automatically limited so as not to exceed the charger's rated charging power of 200 watts. Similarly the discharge current will be limited when the battery voltage is more than 4.3V so as not to exceed the rated discharge power of 30 watts. The actual feeding current will be as follows:

Maximum charge and discharge current for different battery At 250W of input power

battery type	cell counts	rated voltage(V)	Charge current(A)	Discharge current(A)
NIMH/NICD	1	1.20	10	7
	2	2.40	10	7
	3	3.60	10	7
	4	4.80	10	6.3
	5	6.00	10	5.0
	6	7.20	10	4.2
	7	8.40	10	3.6
	8	9.60	10	3.1
	9	10.80	10	2.8
	10	12.00	10	2.5
	11	13.20	10	2.3
	12	14.40	10	2.1
	13	15.60	10	1.9
	14	16.80	10	1.8
	15	18.00	10	1.7
	16	19.20	10	1.6
	17	20.40	9.8	1.5
	18	21.60	9.3	1.4
	19	22.80	8.8	1.3
	20	24.00	8.3	1.3
	21	25.20	7.9	1.2
	22	26.40	7.6	1.1
	23	27.60	7.2	1.1
	24	28.80	6.9	1.0
	25	30.00	6.7	1.0
	26	31.20	6.4	1.0
	27	32.40	6.2	0.9

battery type	cell counts	rated voltage(V)	Charge current(A)	Discharge current(A)
Li-on	1	3.6	10.0	7.0
	2	7.2	10.0	4.2
	3	10.8	10.0	2.8
	4	14.4	10.0	2.1
	5	18	10.0	1.7
	6	21.6	9.3	1.4
	7	25.2	7.9	1.2
	8	28.8	6.9	1.0
	9	32.4	6.2	0.9
	10	36	5.6	0.8
LiPo	1	3.7	10.0	7.0
	2	7.4	10.0	4.1
	3	11.1	10.0	2.7
	4	14.8	10.0	2.0
	5	18.5	10.0	1.6
	6	22.2	9.0	1.4
	7	25.9	7.7	1.2
	8	29.6	6.8	1.0
	9	33.3	6.0	0.9
	10	37	5.4	0.8
LiFe	1	3.3	10.0	7.0
	2	6.6	10.0	4.5
	3	9.9	10.0	3.0
	4	13.2	10.0	2.3
	5	16.5	10.0	1.8
	6	19.8	10.0	1.5
	7	23.1	8.7	1.3
	8	26.4	7.6	1.1
	9	29.7	6.7	1.0
	10	33	6.1	0.9

battery type	cell counts	rated voltage(V)	Charge current(A)	Discharge current(A)
Pb	1	2	10	7
	2	4	10	7
	3	6	10	5
	4	8	10	3.8
	5	10	10	3.0
	6	12	10	2.5
	7	14	10	2.1
	8	16	10	1.9
	9	18	10	1.7
	10	20	10	1.5
	11	22	9.1	1.4
	12	24	8.3	1.3
	13	26	7.7	1.2
	14	28	7.1	1.1
	15	30	6.7	1.0
	16	32	6.3	0.9
	17	34	5.9	0.9
	18	36	5.6	0.8