



TS80 Charger Manual



**AC/DC 10A 80W Touch Screen
Intelligent Balance Charger**

**PLEASE REFER TO ALL SAFETY INSTRUCTIONS
AND NOTES BEFORE USING THIS CHARGER**

Contents

1. Specifications	1
2. Features	2
3. Unit Exterior	3
4. Warnings and Safety Notes	4
5. Program Flow Chart	5
6. Parameter Set Up	6
7. Lithium Battery Program	8
7.1. Lithium Battery Charging.....	8
7.2. Lithium Battery Storage Control.....	10
7.3. Lithium Battery Discharging.....	10
8. NiMH/NiCd Battery Program	11
8.1. NiMH/NiCd Battery Charging.....	11
8.2. NiMH/NiCd Battery Discharging.....	12
8.3. NiMH/NiCd Battery Cyclic Charge/Discharge.....	12
9. Pb Battery Program	14
9.1. Pb Battery Charging.....	14
9.2. Pb Battery Discharging.....	15
10. Digital Power Supply Program	16
11. Check Status	17
12. Warnings and Error Messages	18
13. Warrant and Services	18

1. Specifications

Input Voltage	DC 10-18V
	AC 100-240V
Charge Current	0.1-10A
Discharge Current	0.1-2A
Charge Power	Max 80W
Discharge Power	Max 20W
Balance Current	Max 200mA
Balance Tolerance	$\pm 0.01V$
Charging Capacity	NiMH/NiCd 1-16 Cells
	LiPo/LiFe/Lilon 1-6 Cells
Pb Battery Voltage	2-20V
Discharge Battery	LiPo/LiFe/Lilon 3.0-4.4V/Cell
Weight (g)	420
Dimensions (mm)	164 x 133 x 50

2. Features

Optimised Operating System

Touch screen control allows you to easily set up and monitor the charging/discharging process of the battery via the touch screen. The "AUTO" function sets the current automatically when charging or discharging, preventing the battery from over-charging. These specifications can also be set by the user.

High-power and high-performance circuit

The max output is 80W. The max charge is 10A. The max discharge current is 2A. The CPU or operating program works under such power as the charger is fitted with a highly efficient cooling system.

Balance voltage for Lithium battery packs

The charger has a special internal function for Lithium battery voltage balancing. You do not require an additional balancer to balance the voltage when charging Lithium batteries (LiPo/LiFe/Lilon).

Balance and monitor individual cells in process of discharging

The charger also monitors and balances the individual cells of a Lithium battery pack during the charging process. If the voltage of any cell varies abnormally, the process will be stopped automatically and an error message will appear on the screen.

Accept various types of batteries

This charger can be used with a wide range of batteries with different chemistries (LiPo, LiFe, Lilon, NiMH, NiCd and Pb). Choose the corresponding program, setting the parameters on the base of the battery type and specifications, before you start to charge/discharge.

"Fast" and "Storage" mode for Lithium battery packs

The "Fast" charge reduces the charging time of Lithium batteries. The "Storage" mode controls the nominal voltage of the battery to make it suitable for long-term storage.

Cyclic Charging/Discharging for NiMH/NiCd battery packs

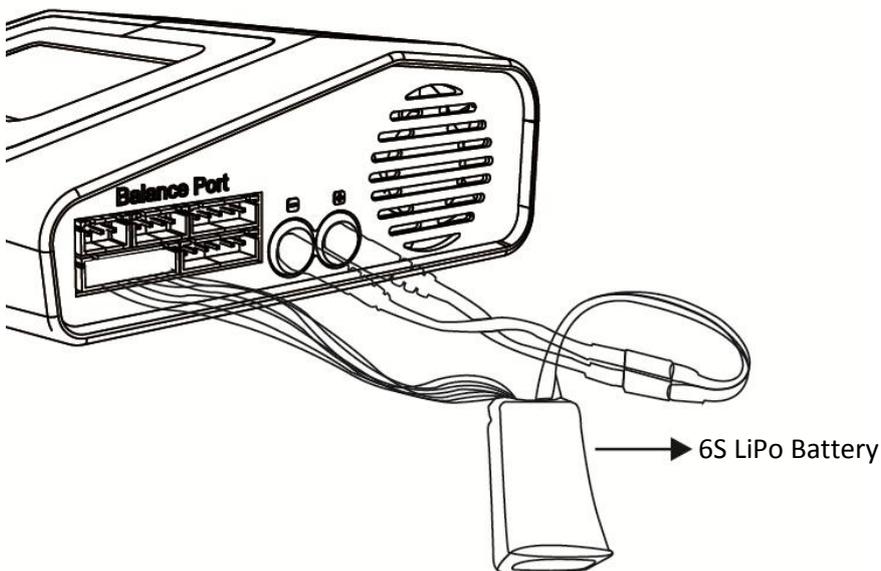
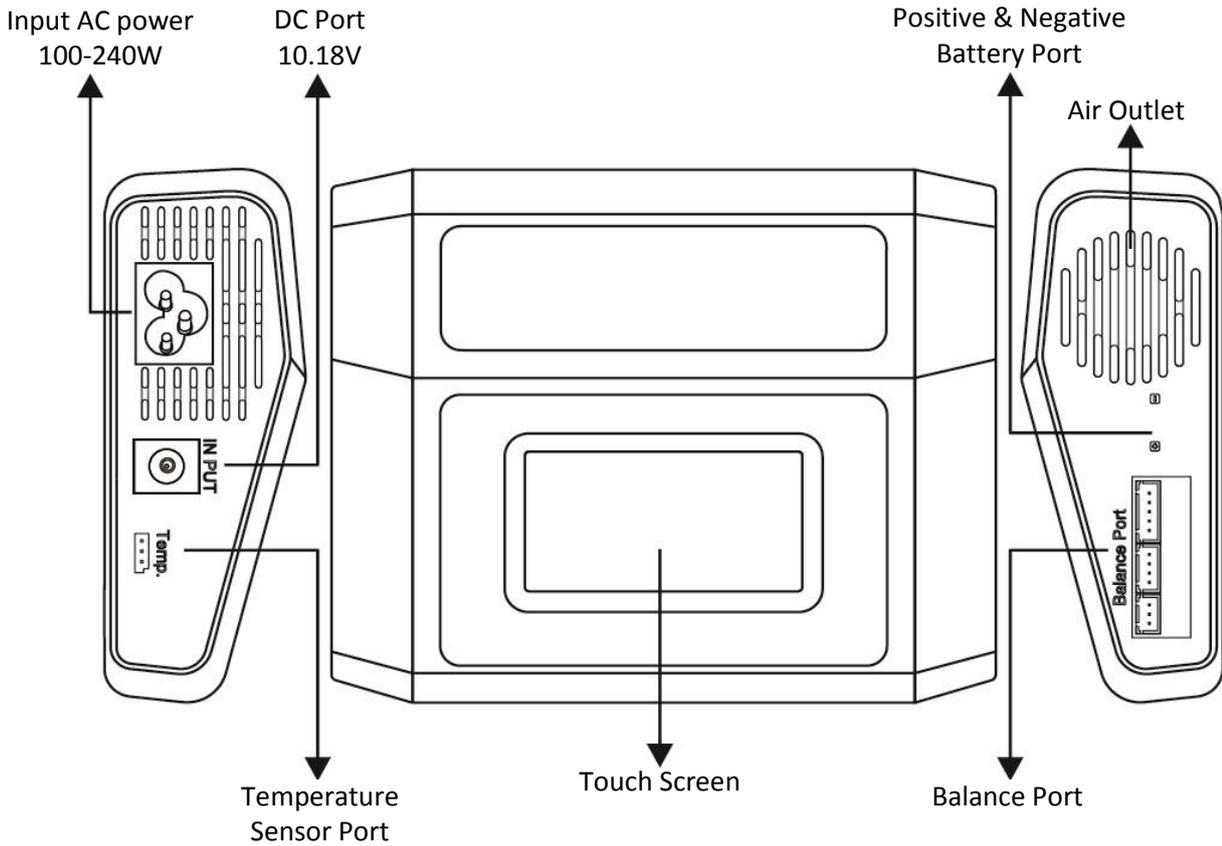
With this charger you can perform 1-4 cycles of charge>discharge or discharge>charge continually for battery refreshing and balancing.

Maximum Safety

- **Delta-peak Sensitivity:** when the battery voltage of NiMH/NiCd batteries reaches the highest point and begins to drop, the charging process will automatically stop.
- **Capacity Limit:** the charging process will terminate automatically when the maximum capacity value that is set is reached.
- **Temperature Limit:** the temperature of the battery will rise during the charging process due to internal chemical reactions. In order to prevent overheating the charging process will forcibly end if the temperature limit that is set is reached. This function is only available by connecting an optional temperature probe, which is not included in the package. Available from Overlander (SKU: 2598).
- **Charge Time Limit:** charging will stop when charge time limit set is reached to avoid any possible over-charging/over-discharging.

- **Input Current Check:** to prevent the battery from being damaged by the input current, the charger monitors the voltage and ends the process automatically when the voltage drops below the lowest limit.
- **Automatic cooling fan:** the automatic electric cooling fan controls the internal temperature of the charger to prevent over-heating.

3. Unit Exterior



4. Warnings and Safety Notes

IMPORTANT! Please follow these instructions for maximum safety, otherwise the charger and/or battery could be badly damaged and may lead to fire, explosion, injury or property loss.

- Never leave the charger unattended when it is connected to its power supply.
- If any malfunction is observed, terminate the process immediately and refer to the manual
- Keep the charger away from dust, damp, humidity, rain, heat, direct sunshine and vibration.
- The circuit of the unit is designed to be powered by 10-18V DC or 100-240V AC only.
- Do not place the charger on flammable or conductive surfaces when charging/discharging. Never use the charger on car seats, carpets or similar surfaces. Do not operate near anything with the potential to catch fire or explode.
- Ensure the unit remains well ventilated by making sure that all ventilation holes are unblocked and uncovered.
- Set the parameters correctly, otherwise the battery could be severely damaged. Lithium batteries especially can cause a fire or explosion when over-charged.

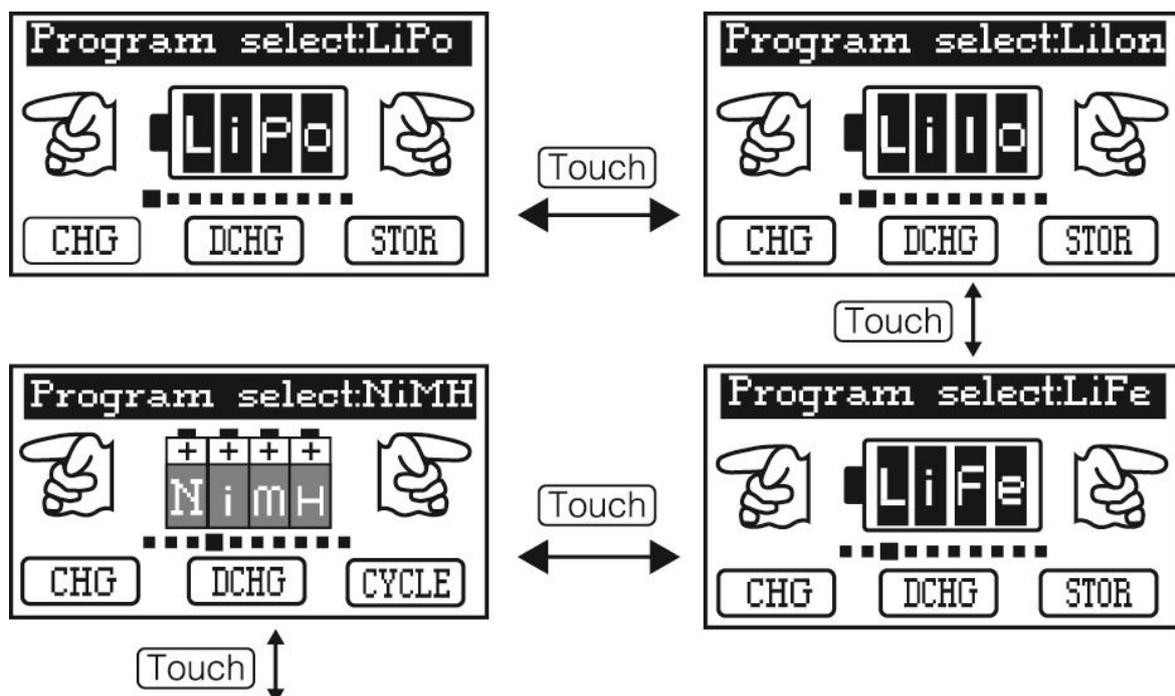
NiMH/NiCd	Voltage level: 1.2V/cell Allowable fast charge current: 1C-2C depending on cell performance Discharge voltage cut-off level: 1.0V/cell (NiMH) and 0.85V/cell (NiCd)
Lilon	Voltage level: 3.6V/cell Max charge voltage: 4.1V/cell Allowable fast charge current: 1C or less Min discharge voltage cut-off level: 2.5V/cell or higher
LiPo	Voltage level: 3.7V/cell Max charge voltage: 4.2V/cell Allowable fast charge current: 1C or less Min discharge voltage cut-off level: 3.0V/cell or higher
LiFe	Voltage level: 3.3V/cell Max charge voltage: 3.6V/cell Allowable fast charge current: 4C or less Min discharge voltage cut-off level: 2.0V/cell or higher
Pb	Voltage level: 2.0V/cell Max charge voltage: 2.46V/cell Allowable fast charge current: 0.4C or less Min discharge voltage cut-off level: 1.5V/cell or higher

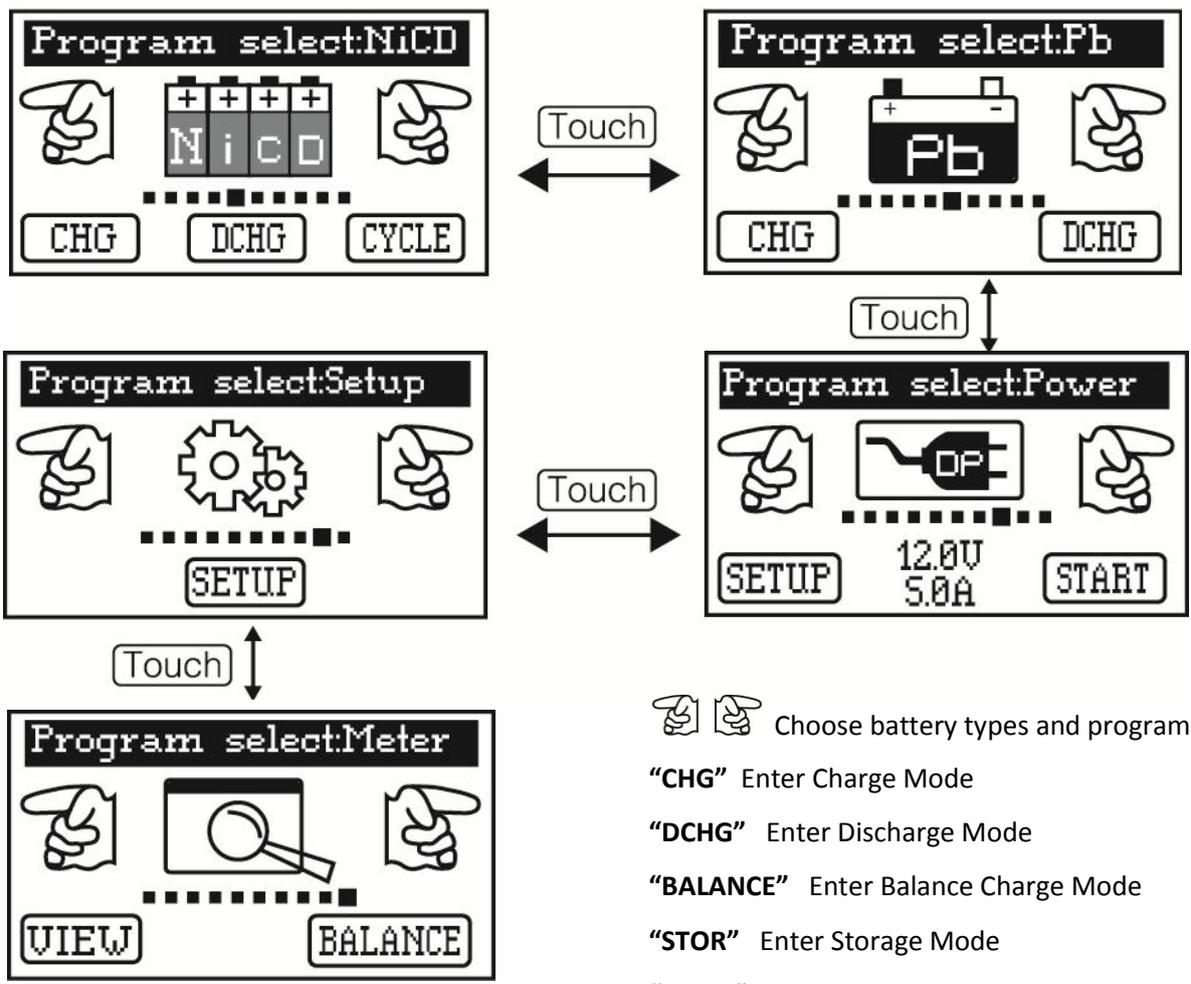
- To avoid short-circuits between the wires, always connect the charge cable to the unit first and then to the battery. Reverse the sequence when disconnecting.
- Always check the capacity and voltage of a Lithium battery pack before starting any process. It may be a mixture of parallel and series connections. In parallel, individual cell capacity

multiplied by the cell count is the pack capacity, but the voltage remains the same. It is important to enter the correct parameters in order to prevent the risk of fire or explosions.

- When setting the discharge parameter, it must be according to the residual capacity of the pack to lower the voltage of the battery. To avoid over-discharging, please set the nominal discharge correctly. The voltage of Lithium batteries must not be discharged lower than the minimum voltage because this can lead to a rapid loss of capacity or a total failure. Generally there is no need to discharge a Lithium battery.
- Some batteries have a 'memory', in that if the capacity is only partially used the battery will 'remember' to just use the same amount in the future:
 - NiMH and NiCd batteries do have a memory function, but usually run complete cycles. This means they are fully charged and then completely used.
 - Lithium batteries prefer a partial rather than full discharge. Frequent full discharge should be avoided if possible. Instead you should charge the battery more often or keep the nominal voltage.
- This charger is not a domestic appliance. It should be used and positioned in the correct environment and should not be used in a domestic setting. Due to the power and volatility of Lithium batteries the charger and battery should be placed on a fireproof base at least 1.5 metres from any flammable materials. Overlander or its retailers accept no liability for losses to 3rd party items caused by failure to follow these instructions.
- By purchasing this product the user assumes all risks associated with its use. If you do not agree with this clause then please return the item immediately before use.
- Failure to comply with these instructions will result in all warranties being deemed void.

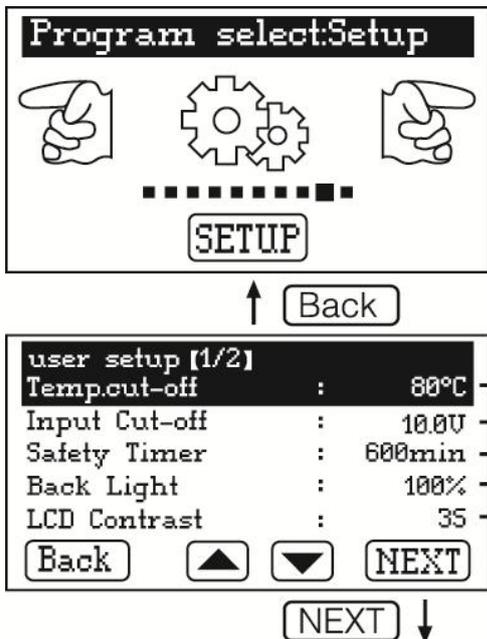
5. Program Flow Chart





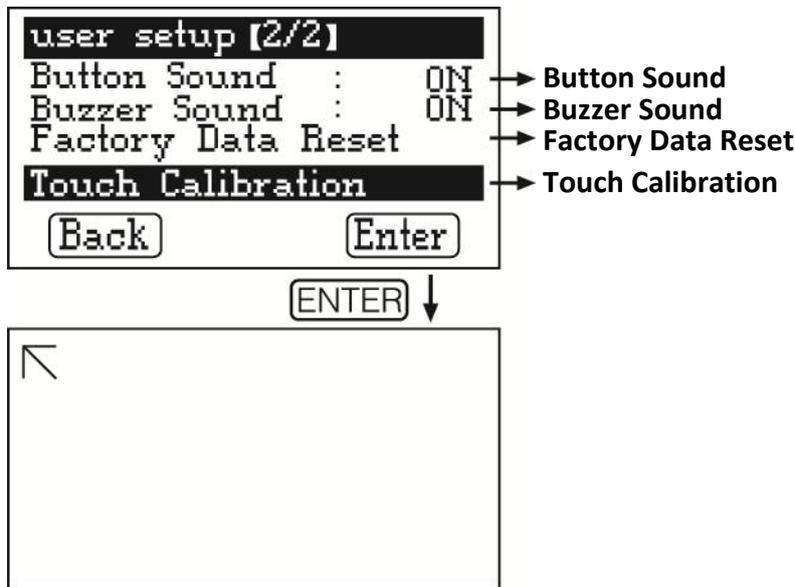
- Choose battery types and program
- “CHG” Enter Charge Mode
- “DCHG” Enter Discharge Mode
- “BALANCE” Enter Balance Charge Mode
- “STOR” Enter Storage Mode
- “CYCLE” Enter Cycle Mode
- “SETUP” Enter System Settings Mode
- “VIEW” Enter Preview Mode

6. Parameter Set Up



Touch the “SETUP” button to go to the data set menu. The default settings will show when connected to the power supply for the first time. If necessary users can change all of the parameters by touching “SETTING”. Click the parameter which you wish to modify, enter the desired value and then save the change. Once happy with all of the parameters, press “Back” to return to the last Menu.

- Temp.cut-off : 80°C → 20°C - 80°C (68F - 176F)
- Input Cut-off : 10.0V → 10 - 18V
- Safety Timer : 600min → 1 min - 720 min
- Back Light : 100% → 0% - 100%
- LCD Contrast : 35 → 35 - 50



Safety Temperature

There is a 3 pin temperature sensor port on the left of the charger. Fit the temperature sensor onto the surface of the battery to closely monitor its temperature. To avoid damage caused by overheating, which can result in fire or explosion, the charger will stop charging/discharging when the monitored value exceeds the set value.

Input Voltage

The Input DC Voltage of this charger is 10-18V. This program will monitor the input voltage of the battery automatically, and if it is lower than the set value the operation will be forcibly stopped to protect the equipment of the input terminal.

Safety Time

Once this function is activated, the safety timer will automatically begin timing from when the charger first starts to work. This program can help to prevent the battery from being overcharged when the system can't detect whether the battery has reached its full capacity. The safety time should be set for long enough to ensure the battery is fully charged.

Contrast Ratio of the LED Screen

This program is used to adjust the contrast ratio and the clarity of the screen.

Key Beep ON/OFF

Once this function is first activated the charger will make a sound to confirm the operation. The charger will then make different sounds in order to alert you of various warning situations or errors.

Factory Data Reset

Once activated all parameters will be reset to the standard factory settings.

Touch Screen Calibration

This should be used when the touch position is deviated or is not sensitive enough. Click "Enter" to go to the Calibration Menu, and click the four arrowheads that will appear in each corner of the screen one by one. This will complete calibration.

7. Lithium Battery Program

Different chemistries have their own specifications, so it is important that the correct program is selected before any operations are started. The following programs are only suitable for charging and discharging Lithium batteries:



(Lithium Battery Program Icons)

7.1. Lithium Battery Charging

Enter the Lithium Battery Program Menu and select the Charging Program. Press “Start” for 2 seconds to enter the menu where you can enter the charging parameters.



“Cell 6S” Charges 1-6S. Select the cell count of the batteries you wish to charge.

“CAPAC 5.0Ah” Maximum charge capacity setting. Select the capacity of the battery.

“CURR 10A” Charge current setting (0.1-10A). Select the charge rate you wish to charge your battery at.

“ENDV 4.20” This is the maximum voltage that each cell within the battery will charge to. This voltage is not to be exceeded.

“Back” Takes you back to the previous menu.

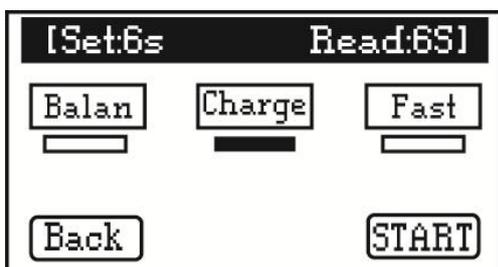
▲ Increase/up button.

▼ Decrease/down button.

“START” Start/confirm button.

Please set the charge current according to the battery capacity and performance. The cell count of the battery is also very important, so make sure the current and nominal voltage are set correctly before beginning the charging process.

After setting the Lithium battery charge parameters, press “START” for 2 seconds to enter the Lithium Charge Mode Menu. Press “Back” to go back to the previous menu if you wish to reselect the battery type and program.



“Set:6S Read:6S” This checks the cell count.

There are three Charging Modes for Lithium battery charging:

“Balan” Balance Charge Mode

“Charge” Normal Charge Mode

“Fast” Fast Charge Mode

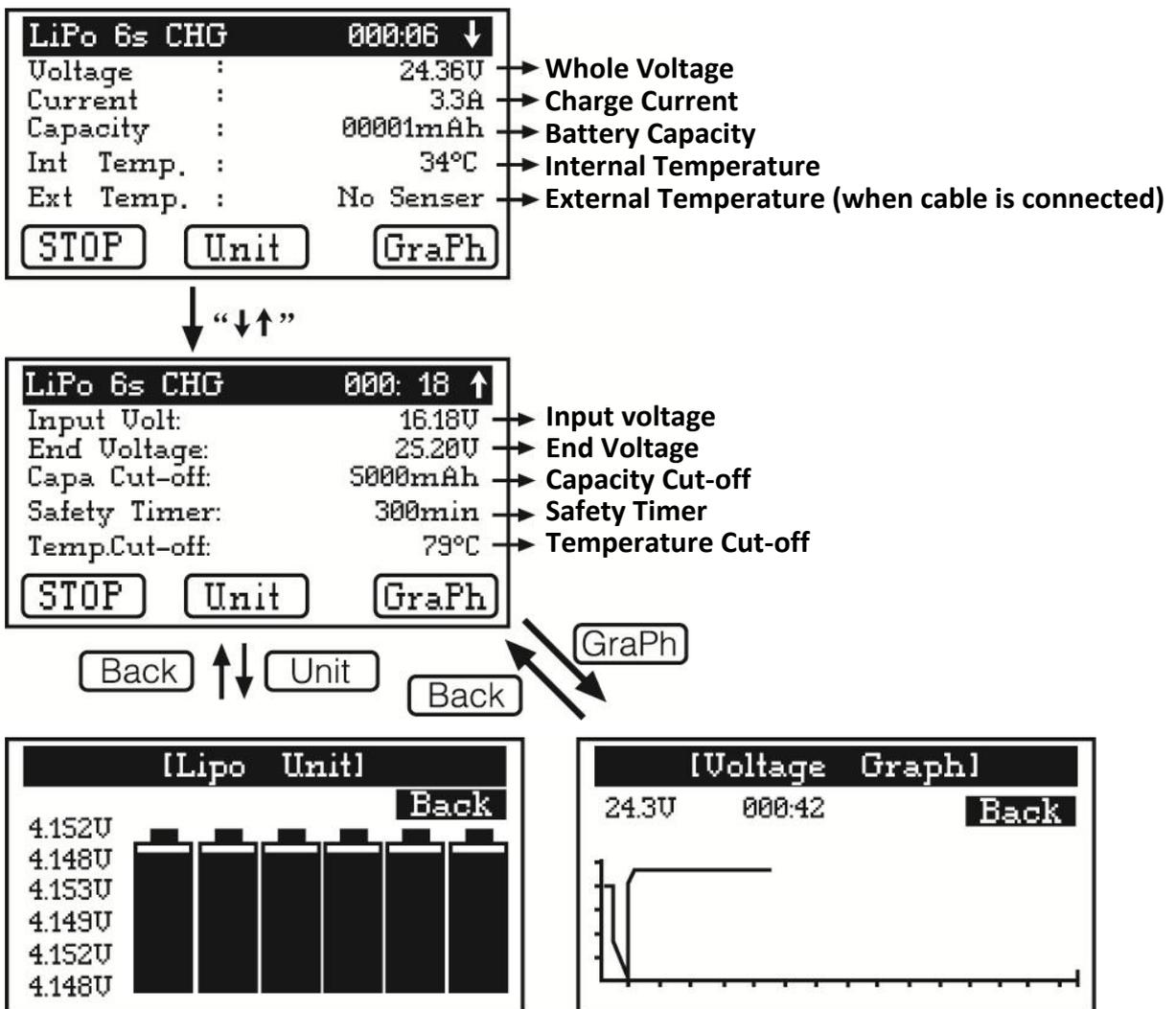
Balance Charging

Use this mode to make the voltage of each cell balanced after charging. The charger will monitor and control the voltages of each cell to balance the individual cell voltage. You must connect the battery to both the output port and balance port of the charger to allow this mode to work.

Fast Charging

The charging current continually reduces as the charging process finishes. The Fast Charging program will finish charging slightly in advance and then omit some CV and complete the balance process. When the process is completely finished the charging current will go to 1/5 of the initial value. The charging capacity may be a bit smaller than normal charging capacity, but the charging time will be decreased.

The set cell count and the detected cell count will be displayed on the top of the screen ("Set" is the cell count the user set in the previous menu, and "Read" is the charger detected cell count). If the data is the same, charging will begin once you have pressed "Start" for 2 seconds. If the data is different, please touch "Back" to go back to the charging parameter menu and check the cell count before charging. The charger will also be able to detect the external temperature of the battery if a temperature-sensor is connected to the corresponding port.



“CHG” The selected Charge Mode
CHG: Charge
BALA: Balance Charge

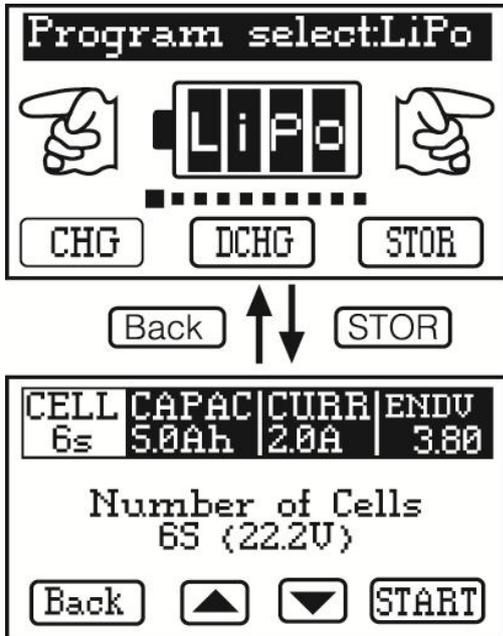
“UNIT” View unit settings

“GraPh” View battery charging graph

↓ ↑ Change interface

“Back” Back to previous menu

7.2. Lithium Battery Storage Control

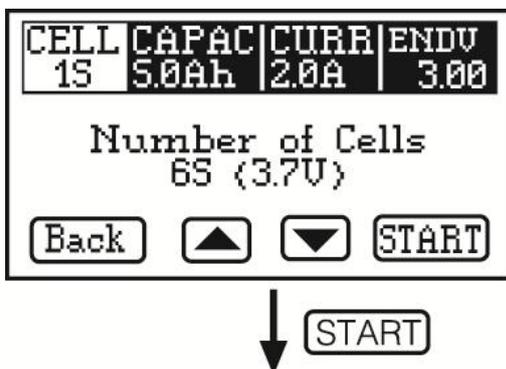


This program is used to adjust each type of battery’s voltage to a level in which it is suitable for long-term storage (LiPo: 3.85V, LiFe: 3.3V, Lilon: 3.75V). This process will discharge the cells if the initial voltage is higher than the storage voltage, or charge them if the voltage is too low.

Select the Lithium battery program, and touch “STOR” to enter the storage mode parameter setting interface. Once you have entered in all of the correct parameters, hold “START” for 2 seconds to begin the storage mode. This process will stop automatically when the battery voltage reaches the set storage voltage, or can be stopped manually by touching the “STOP” button.

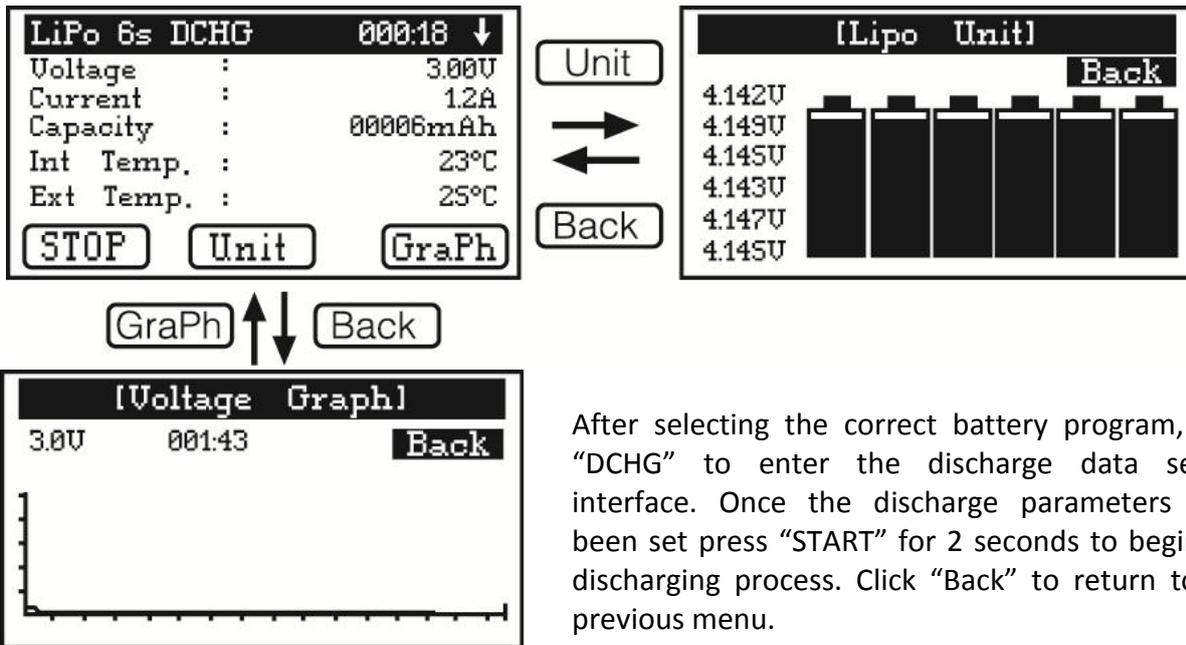
7.3. Lithium Battery Discharging

The purpose of discharging is to confirm the remaining capable capacity of a battery. To avoid over-discharging it is important to set up the correct nominal voltage before beginning the discharging process. The voltage of Lithium batteries should never be lower than the battery manufacturer’s recommended voltage as this could irreparably damage the cells. Usually it is not necessary to discharge a Lithium battery. In order to ensure safety, this charger does not allow the discharge current of a battery to exceed the maximum discharge current as set by the user, which will be displayed on the screen.



“CURR 2.0A” Discharge current setting (0.1-2.0A)

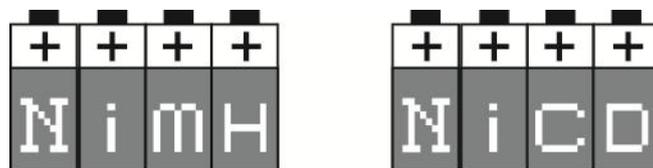
“ENDV 3.00” Discharge end voltage



After selecting the correct battery program, click “DCHG” to enter the discharge data setting interface. Once the discharge parameters have been set press “START” for 2 seconds to begin the discharging process. Click “Back” to return to the previous menu.

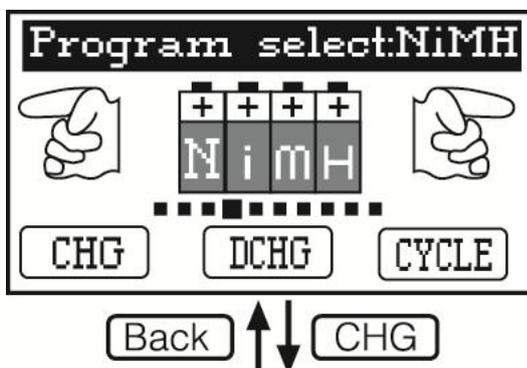
8. NiMH/NiCd Battery Program

This program has been specially designed to also charge and discharge NiMH and NiCd batteries. Once the appropriate program has been selected, use the “INC” and “DEC” buttons to alter the parameters. When modification is complete, press the “START” button for 2 seconds to begin the chosen process.



(NiMH/NiCd Battery Program Icons)

8.1. NiMH/NiCd Battery Charging



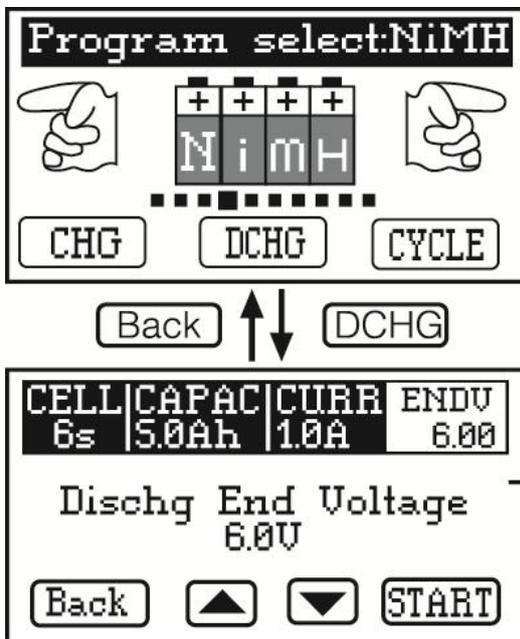
Press the “CHG” button to enter the battery charging parameter setting interface. Once the correct settings have been entered press the “START” button for 2 seconds to begin the charging process. The system should automatically detect the battery connection when charging begins, but if an error message reading “CONNECTION BREAK” appears on the screen, check to make sure that the battery has been correctly connected to the charger.



The screen will display the current charging status, and will stop automatically once this process is complete sounding and audio reminder to notify you when this is done. You can also stop the process manually by pressing "STOP".

If possible always monitor the external temperature of the NiMH/NiCd battery with a temperature sensor (not included in the set) in order to prevent safety issues caused by overcharging and overheating.

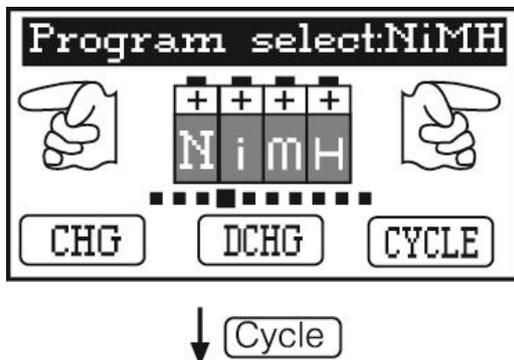
8.2. NiMH/NiCd Battery Discharging



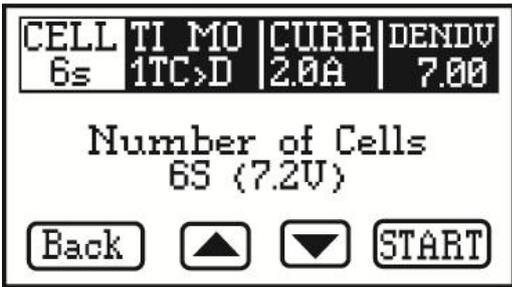
Press "DCHG" to enter the battery discharging parameter setting interface. Once all of the correct settings have been entered press "START" for 2 seconds to start the discharging process. This will stop automatically when the set end voltage is reached, or can be manually ended by pressing the "STOP" button.

→ End voltage of discharging

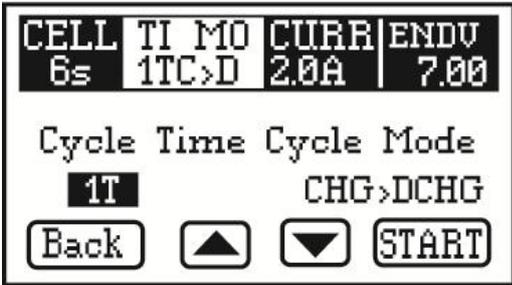
8.3. NiMH/NiCd Cyclic Charge/Discharge



This program is used to balance, refresh and confirm a battery's performance. To avoid overheating set a cooling-off period in the "User Settings" menu after every cycle of charging and discharging. The cyclic range is 1-4.



Select the appropriate NiMH/NiCd battery cell count using the “INC” and “DEC” arrow buttons.



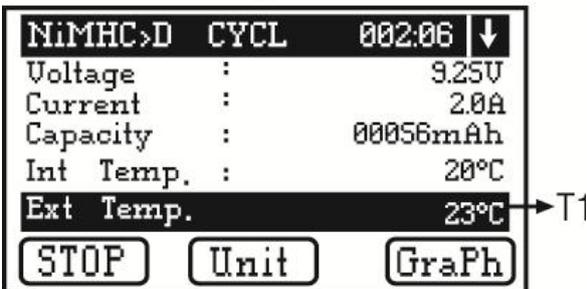
Press “Cycle Time” to set how many times you wish to cycle the battery, and press “Cycle Mode” to set the sequence of charging and discharging.



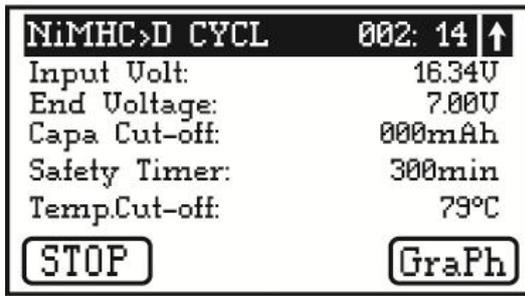
Set the charge/discharge current. Touch “Chg Curr” to set the charge current (0.1-10A) and touch “Dchg Curr” to set the discharge current (0.1-2A).



Set the discharge end voltage of the pack.



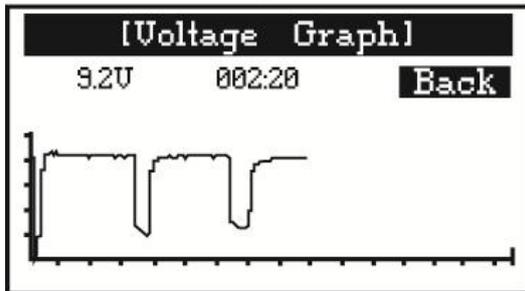
Once the cycling process has begun the data interface will be shown on the screen. If you have connected a temperature sensor, data of this will also be displayed (see T1).



Press the arrow in the top right-hand corner to view more of the data interface. The cycle sequence will show at the top of the screen.

“C>D” Charging

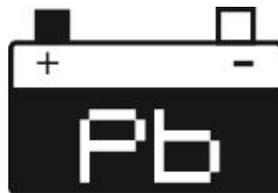
“D>C” Discharging



Touch “GraPh” to view the voltage chart under cycle mode.

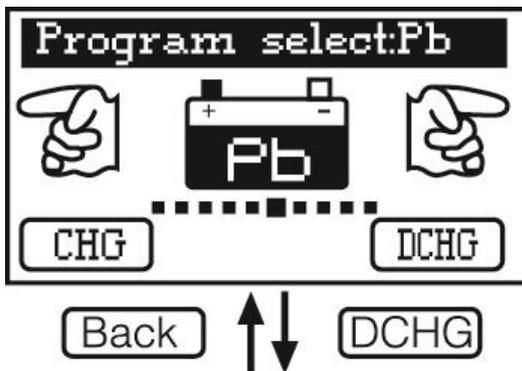
9. Pb Battery Program

This program is designed for charging/discharging Pb batteries with a nominal voltage of 2-20V. It is important that you do not select the incorrect chemistry program. There is a limit to the current when charging as the Pb battery’s maximum charge current should be 1/10 of its capacity. Fast charge is not available for this chemistry.

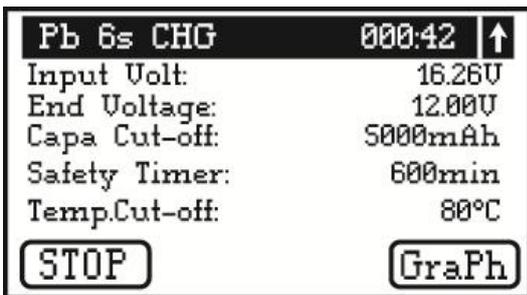
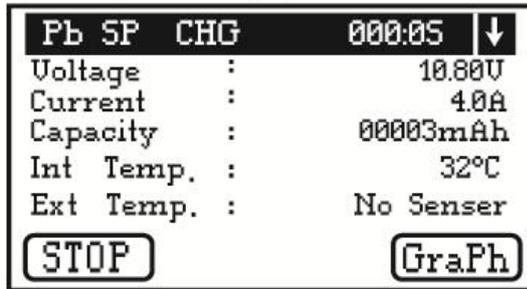


(Pb Battery Program Icon)

9.1. Pb Battery Charging



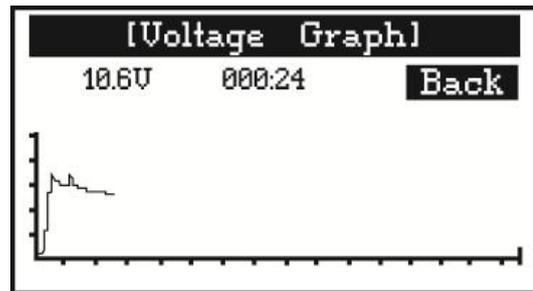
Select the Pb battery program and press the “CHG” button to enter the charging parameter settings menu.



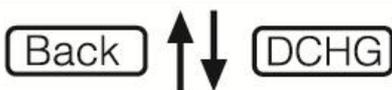
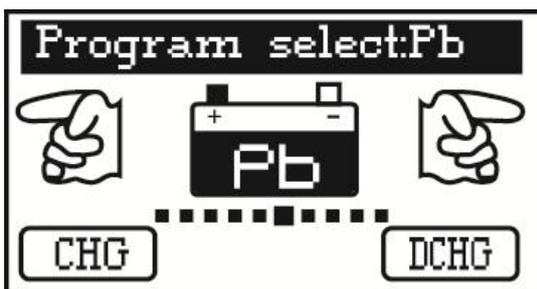
Once all of the correct parameters have been set, press “START” for 2 seconds to begin the charging process.

The system should automatically detect the battery connection when charging begins, but if an error message reading “CONNECTION BREAK” appears on the screen, check to make sure that the battery has been correctly connected to the charger.

The screen will display the current charging status, and will stop automatically once this process is complete sounding and audio reminder to notify you when this is done. You can also stop the process manually by pressing “STOP”.



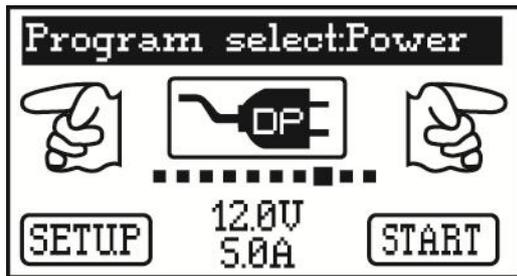
9.2. Pb Battery Discharging



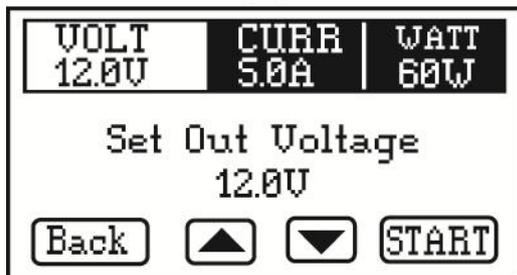
Select the Pb battery program and press “DCHG” to enter the Pb battery discharge parameter settings menu.

Once all of the correct settings have been entered press “START” for 2 seconds to start the discharging process. This will stop automatically when the set end voltage is reached, or can be manually ended by pressing the “STOP” button.

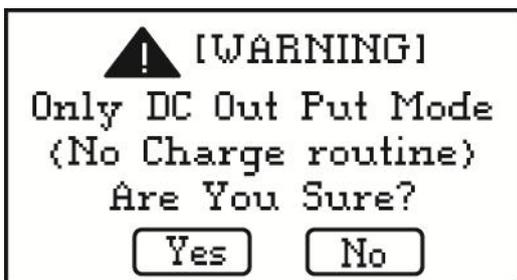
10. Digital Power Supply Program



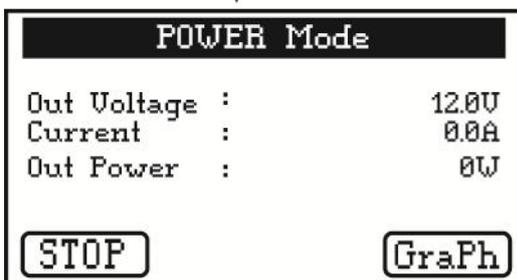
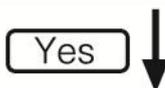
In this program the charger can be used as a power supply to other equipment rather than charging/discharging the battery. The supply voltage range is 3-24V, the current range is 0.1-10A and the power is 80W. Select the "DP" programme and press "SETUP" to bring up the DP parameter settings interface.



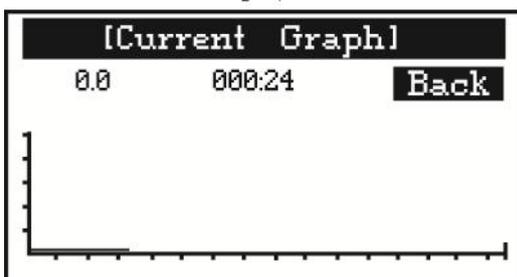
Here can enter the voltage, current and power of the digital power supply. Press "Start" for 2 seconds to bring up the reminder screen.



Press "Yes" to continue using the charger as a power supply, or press "No" to cancel the program.



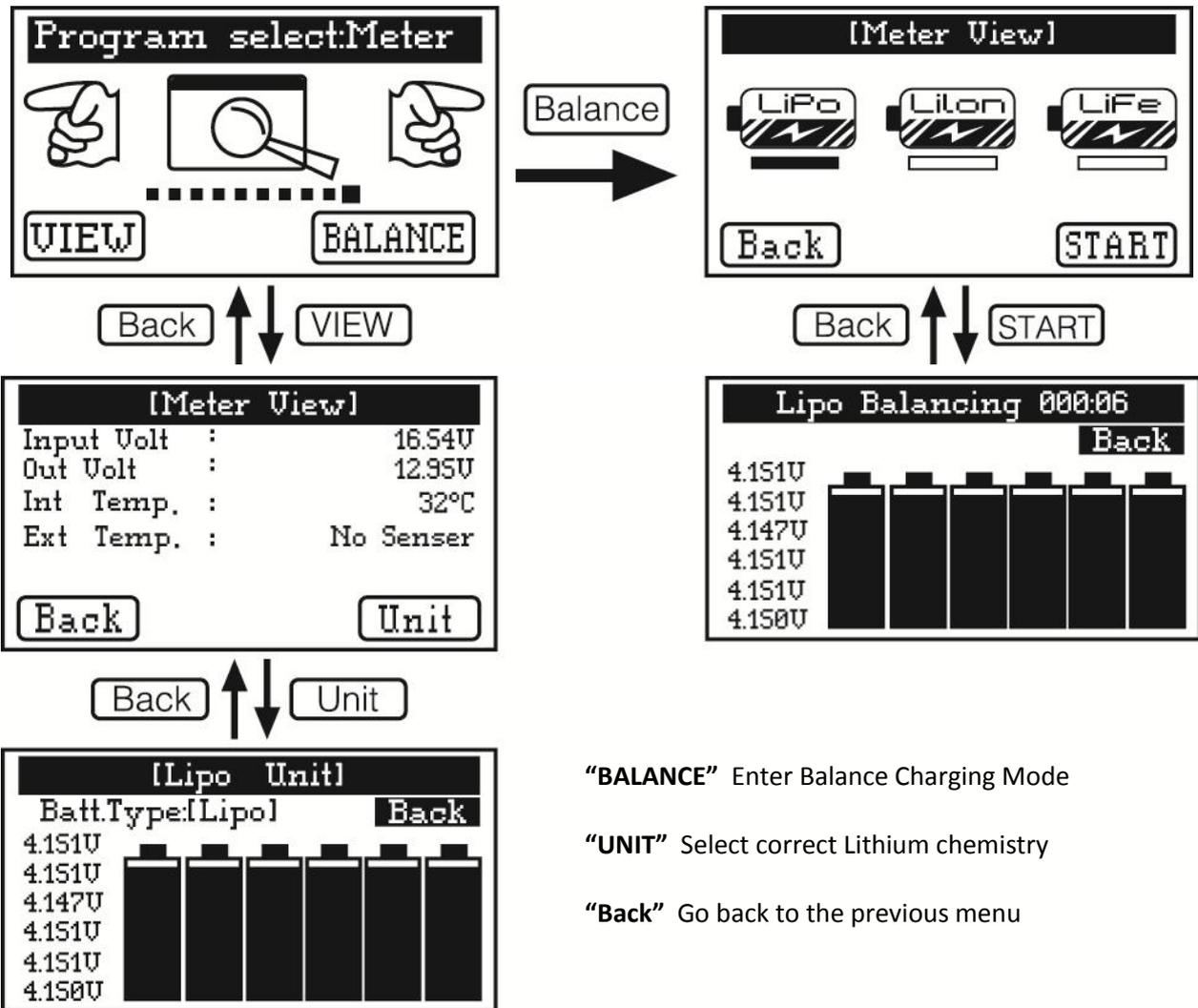
If "Yes" is selected the output voltage, current and power data will be displayed on the screen. Press "GraPh" to display the output current graph. Press "STOP" to return to the parameter settings interface.



11. Check Status

Using this program will allow you to easily discover the input voltage of the power supply, the general voltage of your battery pack, the voltage of each individual cell and the internal temperature of the battery. If you have a temperature sensor (not included in the set) connected, the external temperature of the battery can also be checked.

It is important to select the correct chemistry when using the balance function. Make sure that battery is connected to the charger via the balance leads as well as the output port. Press "START" for 2 seconds to enter the balancing charge mode and begin the balancing process. For further instructions please refer to the Lithium Battery Charging information (page 8).



12. Warnings and Error Messages

This charger is equipped with various safety monitors to ensure it's safe and proper use. If there seems to be an error with the charger and/or battery pack one of the following notifications may appear on the screen:

REVERSE POLARITY	The polarity is reversed. The anode and cathode in the output port of the battery is incorrectly connected.
CONNECTION BREAK	The connection between the battery and the output port is broken, or the charging lead is not properly connected when attempting to charge/discharge.
OUTPUT SHORT CIRCUIT	The output port has short-circuited. Please check the charging cables.
INPUT VOLTAGE ERROR	The input voltage has been set incorrectly. Please make sure that the input voltage is not higher than the limit.
BATTERY LOW VOLTAGE	The detected battery voltage is too low compared to the battery setting voltage. Please check the cell count of the battery has been set correctly.
BATTERY HIGH VOLTAGE	The detected battery voltage is too high compared to the batter setting voltage. Please check the cell count of the battery has been set correctly.
CELL LOW VOLTAGE	The cell voltage of at least one cell in the pack is too low. Please check the voltage of each individual cell.
CELL HIGH VOLTAGE	The cell voltage of at least one cell in the pack is too high. Please check the voltage of each individual cell.
CELL CONNECT ERROR	The connection between the Battery and the charger is faulty. Please check that all connections have been done correctly.
CHARGER OVERHEATING	The internal temperature of the charger is too high. The internal heat of the battery should now be decreasing.
OVER POWER	The digital power supply caused the power to exceed the set limit.
MAX CURRENT	The digital power supply caused the current to exceed the set limit.

13. Warranty and Service

We warrant this product for a period of one year (12 months) from the date of purchase. The guarantee applies only to material or operational malfunctions. During that period, we will try to replace or repair the unit without any service fee. Receipt or proof of purchase is required. This warranty does not cover damaged due to wear, overloading, improper handling, the use of incorrect accessories or failure to follow the supplied warnings and safety instructions.