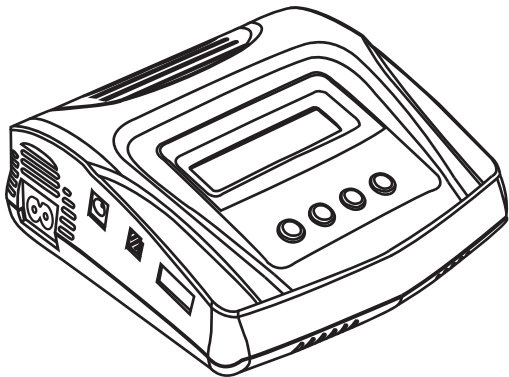# ETRONIX

powerpal 3.0

AC/DC Power Balance
Rapid Charger/Discharger
for LiPo, LiFe, LiIon, LiHV,
NiMH, NiCd & Pb Cells

Thanks for purchasing the Powerpal 3 Charger. This is a charger/discharger with built in microprocessor and newest program. It is not only charge various batteries but also support the DJI Phantom 2 / Phantom 3 and Controller. This charger also equipped with the function of servo test and cell meter. Please read the manual completely and carefully before using.
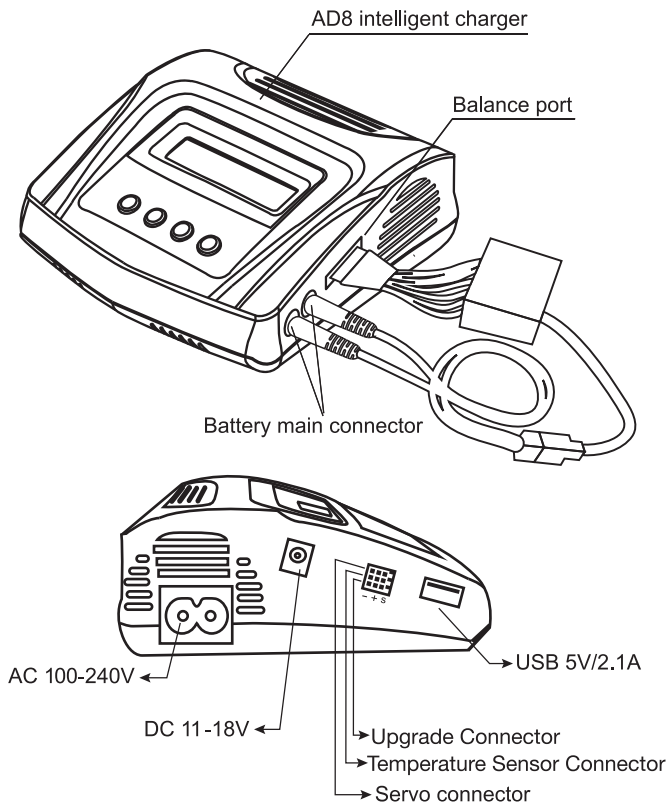
Contents

1. Specification

Input Voltage	[DC.]	10.0~18.0V
	[AC.]	100~240V
Charge Current	[A]	0.1~10A
Discharge Current	[A]	0.1~2A
Charge Power	[W]	MAX.80W
Discharge Power	[W]	MAX.10W
Balance Current	[mA]	MAX.300mA
Balance Precision	[V]	±0.01V
Charging Check cells	NiMH/NiCd	1-16 cells
	DJI Phantom 2/ Phantom 3 battery/ Phantom 2/ Phantom 3 controller	
	LiPo/LiFe/LiIon/LiHv	1-8series
Pb Battery Voltage	[V]	2-28V
Servo tester function	Pulse width	500-2500us
	Neutral Pulse width	1500us
USB output V/A	[V]/[A]	5V/2.1A
Size	mm	136*145*53mm

AD8 intelligent charger

Balance port

Battery main connector

AC 100-240V

DC 11-18V

Upgrade Connector

Temperature Sensor Connector

Servo connector

USB 5V/2.1A

3. Feature

3.1 【Best operation software】

It used the newest system window. It has the function which set the current automatically when Charge/Discharge. Especially for the Li-xx battery, it can avoid the explosion due to the wrong operation by user. All of them can set according to the users' choice.

3.2 【Suit to various batteries 】

It can compatible various batteries: Lilo, Lipo, Life, LiHv, Nicd, Nimh and Pb. Users can charge/discharge the different battery according to the corresponding program and set the different specifications.

3.3 【Servo test function】

It is built in the functional program of servo test. It can test the swing range, respond speed, neutral accurately.

3.4 【USB output】

USB output is 5V/2.1A. It can charge the small battery, such as phone battery and also can charge the Spirit 2 controller. It is more convenient and easy to use.

3.5 【High power and high performance circuitry】

Max power: 80W
Max current: 10A
Max discharge current: 2A
It equipped with the high efficiency cooling system, so the CPU can run normally in this high power

3.6 【Li-xx Battery Voltage Balance】

It has the special balance function for the Li-xx battery, so, it do not need to extra balancer to balance the voltage when charge li-xx battery.

3.7 【Monitor and Balance the Li-xx battery】

It can monitor the single cell when discharge. The discharging will stop and show the error message when the battery voltage is abnormal.

3.8 【Li-xx battery Fast charge and Save Model】

Fast charging can decrease the charging time and save model can save the rated voltage of Li-xx battery for long time

3.9 【Maximum Safety】

Delta-peak Sensitivity: the program of turn-off charge current automatically. The principle of operation is that the charge current will turn off and finish charge when the battery voltage increased to the highest side and start to decreasing.

Capacity Limited: Charge capacity calculated according to charge current multiply charge time. In the situation of the Maximum capacity value was set by users, when the charge capacity have been over the set value then the program will forced to stop charging with alarm.

Temperature Limited: The temperature of battery will increase when charging, if users set the temperature limited, then the charger will forced to stop charging with alarm when the temperature of battery reach to the set value.

Charge time Limited: Limited the charge time and forced to stop charging with alarm.

Input current checking: In order to protect the battery, it can check the voltage of the battery. The charger will turn off charge current with alarm automatically when the voltage decreased to the lowest.

Cooling Automatically: The cooling system will run automatically when the internal temperature is too high

Cyclic charge/Discharge: The Nicd/NiMH battery run 1-4 circle sustained to make the battery update and balance.

4. Maximum Safety

● Never leave the charger unsupervised when charging, if any malfunction is observed please terminate the process immediately and refer to the manual.

● Never put the charger into the place which dust/damp/vibrate.

● The input power only for is DC 10-18V / AC 100-240V.

● Please put it onto the surface which it is firm/Anti flammable. Never put it onto the carpet or others similar objects. Make sure it is far away from the Anti flammable area.

● Never cover the fan, keep well ventilated.

● Make sure the correct setting data, if the program was setting wrong, it will damage the battery. Especially for the Li-xx battery, it will explode for the over charge/discharge.

NiCd/NiMh	Voltage grade: 1.2v/cell Allowed fast charge current: 1C~2C rely on the running of the battery. Discharger voltage cut off grade: 0.85v/cell Nicd battery/Nimh battery 1.0v/cell
LiIo	Voltage grade: 3.6V/cell Max charge voltage: 4.1v/cell Allowed fast charge current: 1C or less Min discharge voltage cut off grade: 2.5V/cell or More
LiPo	Voltage grade: 3.7V/cell Max charge voltage: 4.2V/cell Allowed fast charge current: 1c or less Discharger voltage cut off grade: 3.0V/cell or more

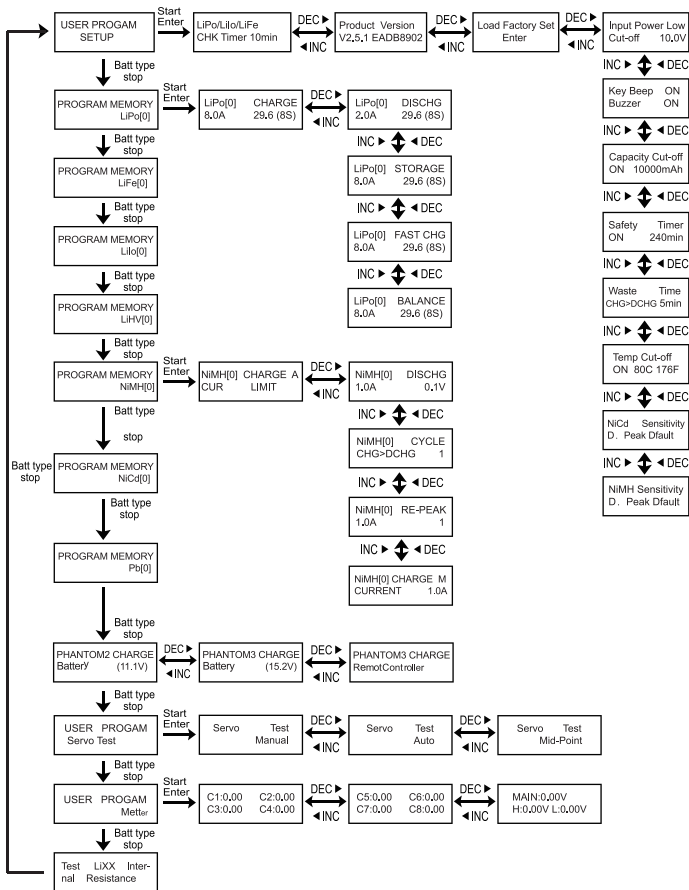| LiFe	Voltage grade: 3.3V/cell Max charge voltage: 3.6V/cell Allowed fast charge current: 4c or less (For example: A123M1) Discharger voltage cut off grade: 2.0V/cell or more
LiHV	Voltage grade: 3.8V/cell Max charge voltage: 4.35V/cell Allowed fast charge current: 1c or less Min discharge voltage cut off grade: 3.0V/cell or More
Pb	Voltage grade: 2.0V/cell （Lead-acid) Max charge voltage: 2.46V/cell Allowed fast charge current: 0.4C or less Discharger voltage cut off grade: 1.50V/cell or more

● It should be connect the cable to the charger first then connect the battery. When disconnecting then it is opposite operation

● It must be to check the voltage and capacity of the Li-xx battery, maybe they comprised of Seriesand Parallel. When it is parallel, the capacity of the battery pack is together with each single battery and the voltage of battery pack will not change. It suggest to choose the Series for the li-xx battery because it possible to lead the explosion if the voltage is un-balance when charging.

Discharge

● The discharge parameter should be set according to the rest of battery capacity or decreased battery voltage. When discharging, it should be pay more attention to the discharge process. It must set the correct discharge voltage, in order to avoid the over discharging. Li-xx battery cannot lower than the lowest voltage, because it is easy to damage the battery. Normally, it do not need to discharge for the Li-xx battery.

● Some batteries have memory function. If the capacity is partly used, they will remember' it and use that part of capacity only next time. This is a 'memory 'function. NiCd /NiMH batteries also have memory function, but they prefer complete cycles. It means they fully charged and then completely used. NiMH battery's memory function is not that good when compared with NiCd battery.

● The Lithium battery prefers a partial rather than a full discharge. Frequent full discharge should be avoided if possible. Instead, charge the battery more often or use a larger battery

● The Lithium battery prefers a partial rather than a full discharge. Frequent full discharge should be avoided if possible. Instead, charge the battery more often or use a larger battery
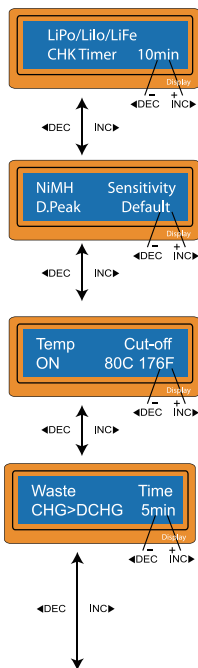
Those warnings and safety notes are particularly important. Please follow the instructions for a maximum safety, otherwise the charger and battery can be badly damaged. Also it can cause a fire, lead to human injury or property loss.

5. Program Flow Chart

The flow chart consists of the following boxes connected by arrows labeled "Start Enter", "Batt type stop", "DEC ►", "◄ INC", and "INC ► ↕ ◄ DEC":

Left column (vertical chain, connected by "Batt type stop"):

- USER PROGAM SETUP
- PROGRAM MEMORY LiPo[0]
- PROGRAM MEMORY LiFe[0]
- PROGRAM MEMORY LiIo[0]
- PROGRAM MEMORY LiHV[0]
- PROGRAM MEMORY NiMH[0]
- PROGRAM MEMORY NiCd[0]
- PROGRAM MEMORY Pb[0]
- PHANTOM2 CHARGE Battery (11.1V)
- USER PROGAM Servo Test
- USER PROGAM Metter
- Test LiXX Internal Resistance

USER PROGAM SETUP row (Start Enter):
- LiPo/LiIo/LiFe CHK Timer 10min
- Product Version V2.5.1 EADB8902
- Load Factory Set Enter

Right column (connected by "INC ► ↕ ◄ DEC"):
- Input Power Low Cut-off 10.0V
- Key Beep ON Buzzer ON
- Capacity Cut-off ON 10000mAh
- Safety Timer ON 240min
- Waste Time CHG>DCHG 5min
- Temp Cut-off ON 80C 176F
- NiCd Sensitivity D. Peak Dfault
- NiMH Sensitivity D. Peak Dfault

PROGRAM MEMORY LiPo[0] row (Start Enter):
- LiPo[0] CHARGE 8.0A 29.6 (8S)
- LiPo[0] DISCHG 2.0A 29.6 (8S)
- LiPo[0] STORAGE 8.0A 29.6 (8S)
- LiPo[0] FAST CHG 8.0A 29.6 (8S)
- LiPo[0] BALANCE 8.0A 29.6 (8S)

PROGRAM MEMORY NiMH[0] row (Start Enter):
- NiMH[0] CHARGE A CUR LIMIT
- NiMH[0] DISCHG 1.0A 0.1V
- NiMH[0] CYCLE CHG>DCHG 1
- NiMH[0] RE-PEAK 1.0A 1
- NiMH[0] CHARGE M CURRENT 1.0A

PHANTOM2 CHARGE Battery (11.1V) row:
- PHANTOM3 CHARGE Battery (15.2V)
- PHANTOM3 CHARGE RemotController

USER PROGAM Servo Test row (Start Enter):
- Servo Test Manual
- Servo Test Auto
- Servo Test Mid-Point

USER PROGAM Metter row (Start Enter):
- C1:0.00 C2:0.00 C3:0.00 C4:0.00
- C5:0.00 C6:0.00 C7:0.00 C8:0.00
- MAIN:0.00V H:0.00V L:0.00V

To avoid user's erroneous setting, it can identify the cells of Lithium battery automatically when start to charge or discharge. But the battery cells might be identified incorrectly when it's deeply discharged. To prevent the error, users can set the time to verify the cells by the processor. Normally, 10 minutes is enough to identify the cells

```
LiPo/LiIo/LiFe
CHK Timer    10min
              Display
         ◄DEC  INC►
```

```
NiMH      Sensitivity
D.Peak      Default
              Display
          –   +
         ◄DEC  INC►
```

```
Temp      Cut-off
ON        80C 176F
              Display
          –   +
         ◄DEC  INC►
```

```
Waste     Time
CHG>DCHG  5min
              Display
          –   +
         ◄DEC  INC►
```

◄DEC   INC►

◄DEC   INC►

◄DEC   INC►

◄DEC   INC►

correctly. For the battery of larger capacity, it may extend the setting time. But if you set the time too long for the battery of small capacity, then the charge or discharge process can be finished within the setting time with the erroneous cells, this will cause serious result. If the processor identifies the cells incorrectly at the beginning of charge or discharge, users can extend the time. Otherwise, keep the default value for best.

The automatic charge trigger voltage, the working principle is thatafter the battery voltage increased to the Maximum value and startto decreasing then the charge current will turn off and finish the charge. If the trigger voltage set higher, there is a danger of over- charging .If it is too low, there is a possibility of stop chargin prematurely. Please refer to the technical specification of the battery (NiCd default voltage: 12mv, NiMH default voltage: 7mv).

There is a temperature sensor port on the left of the charger. It can test the temperature of the battery. When the temperature is over the setting value then the charger will stop to charge/discharge, in order to avoid the over heat of the battery.

Cycling charge and discharge of the battery, the battery will get warm after charge or discharge. After the process of charge and discharge, users can set the time to extend the program, in this way, there have enough time to cooling before the battery enter to the next program. (time range: 1—60minutes). Users can choose the trickle charge mode, turn on or turn off. When users turn on it, the charger will offer the small charge current to finish the final charge automatically after the fast charge. In this way, it will not make the battery over heat.

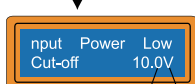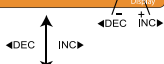| Safety	Timer
ON	240min
	Display
	–DEC +INC

The integral safety timer will start to run automatically when start to charge. If the termination circuit can't detect whether the battery is full or not, this program can prevent to overcharge. The value of the safety timer should be large enough to allow the charging totally.

◄DEC   INC►

Capacity	Cut-off
ON	10000mAh
	Display
	–DEC +INC
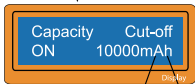
This program sets the maximum charge capacity that will be supplied to the battery during charge. If the delta-pack voltage cannot detect or the safety timer is stopping because of some reasons, the process will stop charging automatically when the capacity is selected.

◄DEC   INC►

Key Beep	ON
Buzzer	ON
	Display
	–DEC +INC

Users can confirm the operation from the Beep sound. It can be ON and OFF

◄DEC   INC►

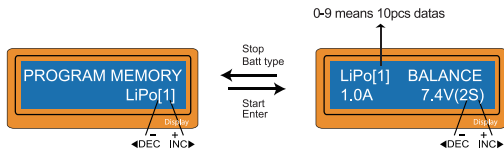| nput Power	Low
Cut-off	10.0V
	Display
	–DEC +INC

The input voltage is 10-18V. This program monitors the input voltage of battery. If the voltage is lower than the setting value, then the operation will be stopped forcedly to protect the input voltage.

◄DEC   INC►

Load   Factory   Set
Enter
Display
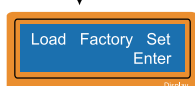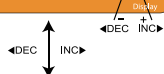
It will back to the product originals setting.

7. Memory Mode

AD8 Charger can save setting data of each programs, it can save 10 groups data for each kind of battery, including the cells of the battery, setting charge current and so on. Users do not need to set the data again when they use the batteries which have been memory. It is easier and more convenient.

0-9 means 10pcs datas

```
PROGRAM MEMORY          LiPo[1]   BALANCE
           LiPo[1]      1.0A       7.4V(2S)
```

Stop / Batt type
Start / Enter

◀DEC INC▶   ◀DEC INC▶

Choose the program of the corresponding battery type, press INC or DEC to choose any one numbers from "0 to 9". Press "Enter" to enter the window of setting data. Users can enter to charge or back from current window after finish the setting, then it do not set any data when you use the battery next time. Of course users can re-set the new data if they want to change.

8. Lithium battery program

These programs are just suitable for charging and discharging Lithium batteries which the nominal voltage is 3.3V, 3.6V and 3.7V. These batteries need to work in different charge modes, there are 2 charge modes: constant voltage (CV) charging and constant current (CC) charging. Different battery capacity and performance make the different current. The final voltage in charging process is also very important. It should be precisely matched with the charging voltage of the battery. Lipo: 4.2v, Lilo: 4.1v, Life: 3.6v, LiHV: 4.35V. So, charging current and nominal voltage should be set up correctly when charging.

Alarm: The LiHV Mode just support to 4.35V Li-battery, it is forbidden to use it for other kind battery. It is cannot charge the lipo battery which the voltage is 4.20V. Otherwise it will lead to explosion.

● The screen turns bright when press Start/Enter, then you can press DEC/INC to change the parameter value, after this, press Start/Enter again to store.

● Within 1 minute after start to Charge/Discharge, users can change the charge/discharge current by "start/Enter". Once you changed the current value, then it will save the new current value if you press "Start/Enter".
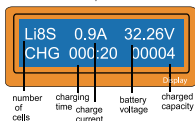
8.1 Li-XX battery ordinary charge mode

```
LiPo[0]    CHARGE
1.0A      29.6V (8S)
```
◀DEC + INC▶   ◀DEC + INC▶

Start ↓↑ Stop
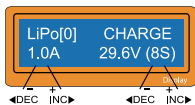
The screen will show the battery type. Lipo, Life, lilo, liHV. Value on the left side of second line is charge current setting and the right side is voltage setting. The charger will check the battery's cells automatic when set to "Auto".   When finish the setting of current and voltage, press Start/Enter key for 3 seconds to start the process.(Charge current: 0.1~10.0A, Cell count: 1~8 cells)

```
R: 8SER   S: 8SER
CONFIRM(STOP)
                Display
```
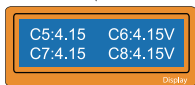
Start ↓↑ Stop

It is displays the cells which you set up and the cells detected by the processor. "R": it means the cells detected by the charger. "S": it means the cells that you selected at the last menu. It can press Start/Enter to start charging if these two values are identical. Otherwise, press Batt Type/Stop to return the last screen to check the cells carefully and charge again.
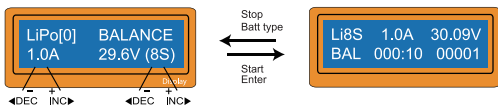
```
Li8S  0.9A  32.26V
CHG 000:20  00004
                Display
```
number charging battery charged
of   time   voltage capacity
cells   charge
        current

◀INC ↓↑ DNC▶

The screen displays the current state of charging. Press Batt Type/Stop to stop charging.

```
C1:4.15   C2:4.15V
C3:4.15   C4:4.15V
                Display
```

◀INC ↓↑ DNC▶
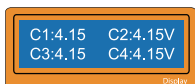
It will show the voltage of each cell after press "INC". It can show 8 groups data for Max.
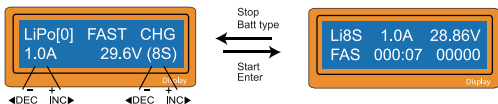"Fuel": the percentage of the capacity
"Cell": the average single voltage

```
C5:4.15   C6:4.15V
C7:4.15   C8:4.15V
                Display
```

◀INC ↓↑ DNC▶

```
Fuel    =    96%
Cell    =    4.15V
                Display
```
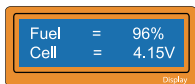
8.2 Charging Lithium battery in balance mode

```
LiPo[0]   BALANCE
1.0A    29.6V (8S)
◂DEC  INC▸   ◂DEC  INC▸
```
Stop
Batt type

Start
Enter
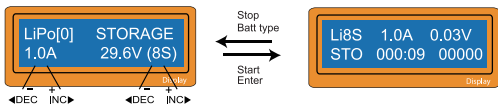
```
Li8S   1.0A   30.09V
BAL  000:10  00001
```

After finish the charge, the voltage of each cell will full. Then the system will monitor the voltage of each cell and control the current of each cell, in this way, it will get the balance. It should to connect the battery to the input connector and also connect the balance connector when charge.

8.3 'FAST' charging Lithium battery

```
LiPo[0]  FAST  CHG
1.0A    29.6V (8S)
◂DEC  INC▸   ◂DEC  INC▸
```
Stop
Batt type

Start
Enter

```
Li8S   1.0A   28.86V
FAS  000:07  00000
```
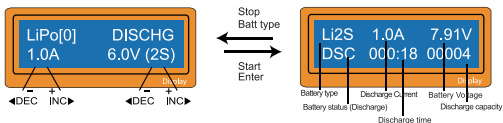
The charging current gets smaller and smaller as the charging process finished. To finish charging in advance, the program leaves out some CV process. Actually, when the fast charging is finished, the charging current will go to 1/5 of initial value. The charging capacity may be a bit smaller than normal charging, but the charging time will be reduced.

8.4 Lithium battery STORAGE' charge Mode

```
LiPo[0]   STORAGE
1.0A    29.6V (8S)
◂DEC  INC▸   ◂DEC  INC▸
```
Stop
Batt type

Start
Enter

```
Li8S   1.0A   0.03V
STO  000:09  00000
```

This is designed for charging or discharging Lithium battery. According to the initial voltage of the battery, the program will determine to charge or discharge the battery to a certain voltage. They are different from the other batteries such as 3.75V for Lilo, 3.85V for LiPo and 3.3V for LiFe, 3.85V for LiHV per cell. If the initial voltage of battery is higher than the storage voltage, the program will start to discharge.

8.5 Discharging Lithium battery

```
LiPo[0]      DISCHG
1.0A       6.0V (2S)
```
◄DEC INC►   ◄DEC INC►

Stop
Batt type

Start
Enter

```
Li2S   1.0A      7.91V
DSC   000:18  00004
```

Battery type   Discharge Current   Battery Voltage
Battery status (Discharge)   Display
               Discharge time   Discharge capacity

The purpose of discharge is to confirm the rest capacity or judge the performance of the battery. In order to avoid over discharge, please set the correct discharge voltage first when you start to discharge. Li-xx battery cannot lower the lowest voltage because it is easy loss the capacity fast. Normally, it's not need discharge for Li-xx battery. The discharge current which showed in the display cannot over the Max current value which set by the original factory. The voltage also cannot lower than the voltage which set by the original factory.
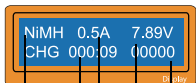
9. NiMH/NiCd battery program

● It designed for charging and discharging NiMH or NiCd battery that commonly used for R/C model application. The screen turns bright when press Start/Enter, then you can press DEC/INC to change the parameter value, press Start/Enter to store

● Within 1 minute after start to Charge/Discharge, users can change the charge/discharge current by "start/Enter". Once you changed the current value, then it will save the new current value if you press "Start/Enter"

● Press Start/Enter for 3 seconds to start the process, press Batt type / Stop to stop.

9.1 Charging NiCd/NiMH battery

```
PROGRAM MEMORY
          NiMH[0]
```
◄DEC INC►

Start   Stop
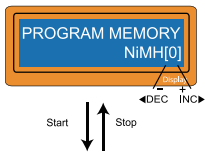
Use the set current you can simply charge the battery. In "A" mode, you need to set the upper limit of charge current to avoid higher charging current may damage the battery. Some batteries of low impedance and small capacity can lead to the higher charge current by the processor in automatic charge mode. But in "M" mode, it will charge the battery with the charge current you set on the screen."Start/Enter" for 3 seconds.
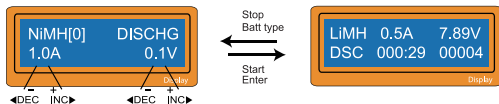
NiMH[0] CHARGE A
CUR LIMIT 0.5A
Display

Press "Enter", Mode A and Mode M will flashing, then press INC or DEC can switch the mode. The program will start and screen will show the charge current status after press "Start/Enter" for 3 seconds.
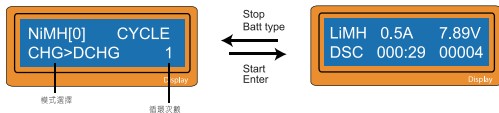
Start
Enter

NiMH 0.5A 7.89V
CHG 000:09 00000
Display

Press "Batt type/ Stop" to stop.

number of cells
charging time
charge current
battery voltage
charged capacity

9.2 Discharging NiCd/NiMH battery

NiMH[0] DISCHG
1.0A 0.1V
Display

◄DEC INC►   ◄DEC INC►

Stop
Batt type

Start
Enter

LiMH 0.5A 7.89V
DSC 000:29 00004
Display

Set discharge current on the left side and nominal voltage on the right. The discharge current ranges from 0.1 to 1.0A, and the nominal voltage ranges from 0.1 to 25.0V. Press Start /Enter for 3 seconds to start the discharging process.
Press Batt type/Stop to stop discharge.

9.3 NiMH /NiCd battery charge and discharge mode cycle

NiMH[0] CYCLE
CHG>DCHG 1
Display

模式选择   循环次数

Stop
Batt type

Start
Enter

LiMH 0.5A 7.89V
DSC 000:29 00004
Display

Set the sequence on the left and the number of cycle (1-5) on the right. You can use this function to balance and refresh or cut off battery. To avoid temperature rising of the battery, there will a brief cooling process after each charge and discharge cycle. In this process, press "Batt type /stop" to stop the program.

9.4 NiMH/NiCD Battery second charge

```
NiMH[0]    RE-PEAK
1.0A              1
                        Display
```

Start
Stop

```
LiMH  1.0A      7.96V
CHG   000:07  00001
                        Display
```

battery set(0.1-10A)   times set(1-3)
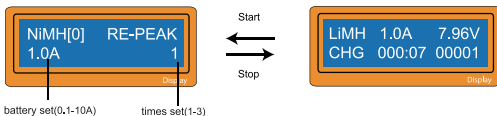
The charger has the new program which can charge the battery for second time. (The battery which do not using for a long time or the old battery or the battery which can not arrive the Max voltage after the first charge). In this way, this mode can make the battery's capacity to the standard value and make the battery's life for longer time.

Set the charge current in the left, set the second charge times in the right. The program will start after press "Start/Enter" for 3seconds and the program will stop after press "Batt type/Stop". Users can change the charge/discharge current by the key of "Start/Enter" in the process.
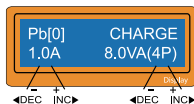
10. Pb battery program

This is designed for charging Pb battery with nominal voltage from 2 to 20V. Pb batteries are totally different from NiCd or NiMH batteries. Since the capacity of Pb battery is lower than NiCd or NiMH batteries', they can only deliver lower current compared with NiCd or NiMH batteries and have current limits when charging. Pb battery's current is 1/10 of its capacity. And fast charging is not allowed, you have to operate it according to the instruction of the manufacturer.

10.1 Charging Pb battery

```
PROGRAM MEMORY
              Pb[0]
                        Display
```
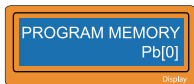
Choose the PB battery window, press Start to enter.

Start   Stop

```
Pb[0]         CHARGE
1.0A       8.0VA(4P)
                        Display
```
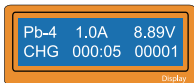◄DEC INC►   ◄DEC INC►

Set charge current on the left side (01.-10A) and nominal voltage on the right (2-28V). Press Start /Enter for 3 seconds to start the charging process. Press "Batt type/Stop to stop the charge.
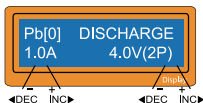
Batt type / Stop ↕ Start / Enter

| Pb-4 | 1.0A | 8.89V |
| CHG | 000:05 | 00001 |

Display

Within 1 minute after start, press Start/Enter to change the charge/discharge current.

10.2 Discharging Pb battery

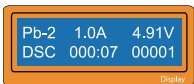| Pb[0] | DISCHARGE |
| 1.0A | 4.0V(2P) |

Display

◄DEC + INC►   ◄DEC + INC►

Set discharge current on the left side (01.-2A) and nominal voltage on the right (2-28V). Press Start /Enter for 3 seconds to start the discharging process. Press "Batt type/Stop to stop the discharge.

Batt type / Stop ↕ Start / Enter '> 3 seconds'

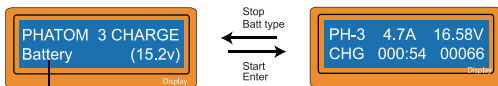| Pb-2 | 1.0A | 4.91V |
| DSC | 000:07 | 00001 |

Display

Within 1 minute after start, press Start/Enter to change the discharge current.

11. DJI Phantom series battery charge program

AD8 Charger is the intelligent multi-functional charger. It can charge many different types batteries and also can charge the DJI batteries.
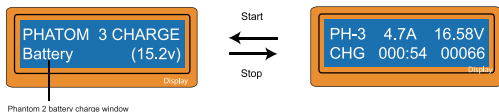
11.1 DJI Phantom 3 battery charge program

| PHATOM 3 CHARGE |
| Battery (15.2v) |

Display

Phantom 3 battery charge window

Stop / Batt type ⇄ Start / Enter

| PH-3 | 4.7A | 16.58V |
| CHG | 000:54 | 00066 |

Display

The special battery's capacity of Hantom 3 professional and Phantom 3 advanced is 4480mAh and the standard voltage is 15.2V.

It is easy to operate the charger to charge the DJI batteries. Connect the battery and press Start/Enter more than 3 seconds then the program will start and press Batt type/Stop to stop the charge.
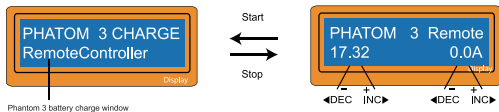
11. 2 DJI Phantom 2 battery charge program

```
PHATOM  3 CHARGE
Battery          (15.2v)
                  Display
```
Phantom 2 battery charge window

Start
Stop

```
PH-3   4.7A   16.58V
CHG   000:54   00066
                  Display
```

The special battery's capacity of Hantom 2 and Phantom 2 vision and Phantom 2 Vision+ is 5200mAh and the standard voltage is 11.1V. (will change the 3 to 2 in the future)

Connect the battery and choose the charge program of Phantom 2, then press Start/Enter for more than 3 seconds then the program will start and press Batt type/Stop to stop the charge.

11.3 DJI Phantom 3 controller charge program

```
PHATOM  3 CHARGE
RemoteController
                  Display
```
Phantom 3 battery charge window

Start
Stop

```
PHATOM  3  Remote
17.32           0.0A
                  Display
◄DEC   INC►    ◄DEC   INC►
```

This charger also can charge the controller of Hantom 3 Professional and Phantom 3 Advanced, it is easy to use and more convenient.

Connect the controller and choose the program window as the above picture then press Start/Enter for more than 3 seconds then the program will start and press Batt type/Stop to stop the charge.

Specially: Phantom 2 controller can charge by the USB, it is easy to use and more convenient.

12. Servo test program

This charger has the servo test function. It is more accurate than some others servo testers. It can test the position/opposition move. Testing and setting the dummy, joggle, neutral of the server. If it connect to the ESC (brushless or brush) then it can adjust the speed by manual, it is more convenient.

12.1 Manual test

```
Servo          Test
               Marual
                    Display
      ◄DEC  INC►
       -    +
Start      Stop
```
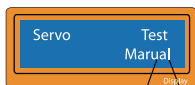
Choose Servo Test window, press Start to enter the testing window, it will show the manual test program in left, press Start to enter.
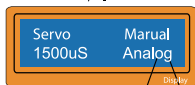
```
Servo        Marual
1500uS       Analog
                  Display
      ◄DEC  INC►
       -    +
Start      Stop
```

Setting pulse by manual (500-2500us), Analog means that PWM input is 50Hz. Digital means that PWM input is 100Hz. Press Start to choose these 2 modes.

```
Servo        Marual
1500uS       Digital
                  Display
```

The input pulse width value adjusted by INC or DEC，then the servo will run to the corresponding site according to the pulse width value which you set．The input pulse width value adjusted by INC or DEC，Press Batt type/Stop to stop.

12.2 Neutral test

```
Servo          Test
          Mid-point
                  Display
Start      Stop
```

Choose Servo test program window, press Start to enter the testing window. press INC or DEC to choose the Neutral test program. Press Start to enter and press Batt type/ Stop to stop
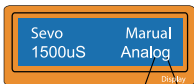
| Servo Mid-point |
| 1500uS |
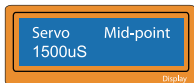
After enter to the Neutral test, the servo will in the neutral position. It can judge the quality according to this operation.

12.3 Automatic test

| Sevo Test |
| Auto |

Choose Servo Test program window, press Start to enter window. press INC or DEC to choose Servo automatic test program, Press Start to enter.

Start   Stop

| Sevo Marual |
| 1500uS Analog |

◄DEC   + INC►
        ‒

Setting pulse by manual (500-2500us), Analog means that PWM input is 50Hz. Digital means that PWM input is 100Hz. Press Start to choose these 2 modes.

Start   Stop

| Sevo Marual |
| 1500uS Digital |

◄DEC   + INC►
        ‒

In the automatic mode, pulse of servo will cycle from 500-2500-500. Press Batt type/ Stop to stop.
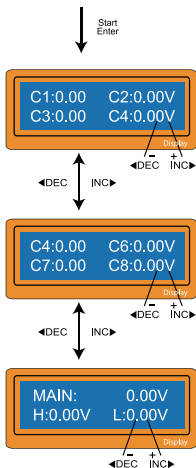
13. Cell Meter test program

This charger also can be used to as the cell meter. It can show the average voltage of each cells and the highest/lowest voltage.

| USER PROGAM |
| Metter |

Choose the cell meter program window, press Start to enter.

Show 1-4cell battery voltage, press DEC to show 5-8cell's voltage

Show 5-8cell's battery voltage.

Press Start to show the highest/lowest voltage of the single cell and the voltage of each cell.

14. IR test program

It will know the performance of the battery from the IR value. The value of the IR which tested by this charger is the relative value (it is not the absolute value). If you want to compare with several more batteries, it is better test in the same voltage. If the test data is near, then the performance of the battery is better.
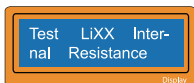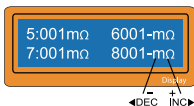

Choose the IR test program, press Start to enter.
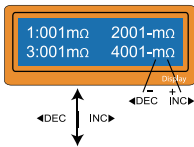
Show 1-4 cell battery IR.

◀DEC   INC▶

Show 5-8cell battery IR.

15. Error information

It will show the Error information when the wrong operation. The screen will show the error information with alarm automatically when the charger have any wrong operation

Battery output Polarity connection.

Interruption of battery and output, or the charger wire was not been connected well when operate the charge or discharge output.

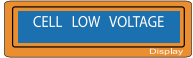Short-circuit of the output terminal. Please check the charger wire.

The voltage of the input terminal is lower or higher than the setting limit.

The voltage is lower than which is set. Please check the number of cells in the battery pack.

The voltage is higher than which is set. Please check the number of cells in the battery pack.

Voltage of one cell in the battery pack is too low, please check the voltage of each cell.

CELL HIGH VOLTAGE *Display*	Voltage of one cell in the battery pack is too high; please check the voltage of each cell.
CELL CONNECT ERROR *Display*	Wrong connection of the connector detected; please check the connector and cable.
CHARGER OVERHEATING *Display*	The internal temperature of the unit goes too high. Cool down the unit.
MAX POWER *Display*	Output power is over the Max Limit value.
MAX CURRENT *Display*	Output current is over the Max Limit value.

16. 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 such material or operational defects, which are present at the time of purchasing the product. During that period, we will replace without service charge any product deemed defective due to those causes. You will be required to present proof of purchase (invoice or receipt). This warranty does not cover the damage due to wear, overloading, improper handling or using of incorrect accessories.

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