

# 8S Battery Capacity Meter

## User Instruction Battery detector/Balance discharger/Servo tester

### 1. 8S Battery Capacity Meter Introduction

8S Battery Capacity Meter is a meter device which could detect status of battery. The battery type includes mostly chargeable batteries. **Battery type:** Li-ion, Li-PO, Li-Fe, Li-Hv, Ni-Cd and NiMH.

The device supports 2-8S Lithium battery (Li-Po, Li-ion, Li-Fe, Li-Hv) when the battery do not need to be powered up. It needs to be connected more than 3S Nickel battery or UBEC 5V to NiCd/MH port as power supply when test 1S Lithium battery.

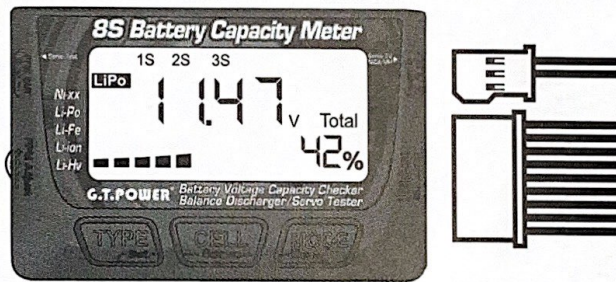
For Nickel battery type, the 8S Battery Capacity Meter supports 4-8S without extra power supply. And it needs to be connected 2-8S Lithium battery to Lithium port as power supply when test less than 4S Nickel battery.

### 2. Battery Connection

Two kinds of Lithium battery connection port for 8S Battery Capacity Meter:

The standard of Lithium battery connection port is 9pin 2.54mm spacing, and 2.54mm spacing balance plug of Lithium battery pack could be plugged into directly. Negative of balance plug align  $\ominus$  of 8S Battery Capacity Meter Lithium port. (Negative pole  $\ominus$  close to NiCd/MH port)

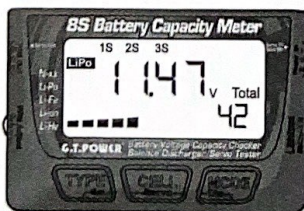
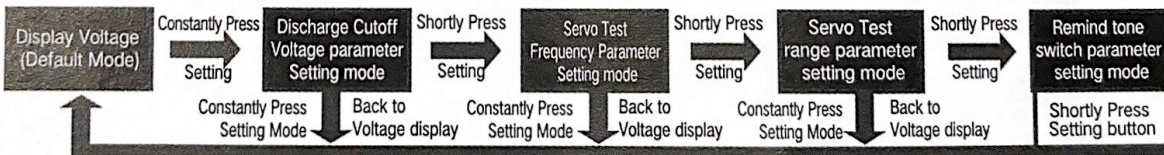
The standard of Nickel battery connection port is 3pin 2.54mm spacing, and 2.54mm spacing main wire plug of Nickel battery pack could be plugged into directly. Normally, the main wire plug of Nickel battery pack is 2pin. Negative align  $\ominus$  on the top of 3pin port, Positive align  $\oplus$  in the middle of 3pin port.



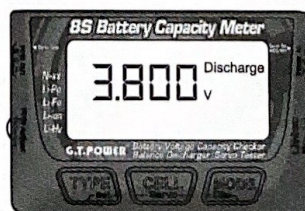
Lithium battery and Nickel Battery Connection Diagram

### 3. Parameter Setting

Under the working status when 8S Battery Capacity Meter connects Lithium battery or Nickel battery, constantly press (constantly press above 1S) Setup Menu Button, enter to Parameter Setting mode. Under Parameter Setting Mode, shortly press Setup Menu button to go to next parameter setting, and constantly press Setup Menu button to exit Parameter Setting Mode and go back to battery detect mode. Under Parameter Setting mode, shortly press Cell button to decrease parameter, shortly press Mode button to increase parameter. Under status of discharge cutoff voltage parameter setting, constantly press Cell Button to decrease quickly, and constantly press Mode button to increase quickly.



Voltage Display Mode



Discharge Cut-off Voltage Setting Mode

Discharge cut-off voltage setting range: 2.000-4.200V



Servo test Frequency Setting Mode

Servo Test Frequency Setting: 50Hz, 60Hz, 100Hz, 125Hz, 200Hz, 250Hz, 300Hz



**Servo Test Range Setting**  
Servo Test Signal Range setting:  
500-2500us



**Remind Tone Switch Setting**  
Sound switch setting: on, off

#### 4. Lithium Battery Detect Mode

Connect balance wire plug of Lithium battery (Li-Po, Li-ion, Li-Fe, Li-Hv) which is ready to be detected to 9pin Lithium Port of 8S Battery Capacity Meter. 8S Battery Capacity Meter start to work after powered up by Lithium battery, LCD screen would display Lithium battery cells, total battery voltage, battery type, percentage and bar chart of battery rest capacity. The percentage and bar chart of rest battery capacity will be accurate only when Lithium battery type is selected correctly, due to there is different nominal voltage and corresponded battery capacity relationship for different battery type. Shortly press Type button in Lithium Battery Detect Mode, it could be switched circularly between Li-Po, Li-ion, Li-Fe and Li-Hv with a possible situation.

Under Lithium battery Detect Mode, LCD screen would display every cell battery voltage display mode from battery voltage display status after shortly press Cell button. It would switch to next cell voltage display when shortly press Cell button each time, 1S-2S...8S-1S...Switch voltage display circularly.

(Suppose that the number of detected Lithium cell is n, then it would display 1S-nS. 8S Battery Capacity Meter would display the cell and voltage of detected battery.)

Shortly press Mode button in Lithium battery Detect Mode, LCD screen would display value of highest cell voltage, and the highest cell will be displayed on the top of screen. Shortly press Mode Button again, LCD screen would display value of lowest cell voltage, and the lowest cell will be displayed on the top of screen. Shortly press Mode button one more time, LCD screen would display the value of voltage difference that highest cell voltage value minus cell voltage value, and highest voltage cell and lowest voltage cell will be displayed on the top of screen.

#### 5. Nickel Battery Detect Mode

Connect the main wire polarity plug of Nickel battery (NiCd and NiMH) which is ready to be detected to 3pin NiCd/MH port of 8S Battery Capacity Meter properly. Without connecting Lithium battery, 8S Battery Capacity Meter is powered up by Nickel battery and then start to work. The lithium battery cell, total battery voltage will be displayed on the LCD screen.

(If Lithium battery powers up 8S Battery Capacity Meter as power supply, it has to shortly press Type button to switch Nickel Battery Detect Mode.)

It could not display the voltage value of each battery cell as it is battery main wire polarity detection for Nickel Battery Detect but not balance wire plug detect like Lithium Battery Detect. It would only display Cell count, total battery voltage.

#### 6. Lithium Balance Discharge Mode

Insert balance wire plug of Lithium battery (Li-Po, Li-ion, Li-Fe, Li-Hv) which is required to be discharged to 9pin Lithium port of 8S Battery Capacity Meter properly. LCD screen would display the total voltage and other parameter of Lithium battery after 8S Battery Capacity Meter is powered up and start to work. 8S Battery Capacity Meter goes into balance discharge mode after constantly press Mode (discharge) button, and start to balance discharge Lithium battery with following the discharge cutoff voltage parameter.

Balance discharge the voltage of connected battery to setting discharge cutoff voltage. If the voltage of any Lithium battery cell is less than setting discharge cutoff voltage, the unit will not switch to balance discharge mode when constantly press Mode (discharge) button, and there is BB tone as error warning tone to remind user that the parameter of discharge cutoff voltage is set incorrectly.

BB tone rings all the time to remind user when balance discharge is finished on the 8S battery Capacity Meter. Please unplug the lithium battery with finished balance discharge from the 8S battery Capacity Meter port in time. If lithium battery connects to the port of 8S Battery Capacity for a long time after finishing balance discharge, the each cell voltage of lithium battery would not be balance anymore caused by unit standby power consumption leads to 1S and 2S cell voltage decreases constantly and the unit is powered up by 1S and 2S cell of lithium battery.

It goes to balance mode when press Mode (Discharge) button in balance discharge mode. In balance mode, the lowest cell voltage is the standard voltage value. The unit discharges other cells which are higher than the standard voltage value. The balance discharge is finished when every cell voltage is same with the standard voltage value. After finishing balance discharge, the BB tone keeps ringing to remind user. Please unplug the Lithium battery in time. If lithium battery connects to the port of 8S Battery Capacity for a long time after finishing balance discharge, the each cell voltage of lithium battery would not be balance anymore caused by unit standby power consumption leads to 1S and 2S cell voltage decreases constantly and the unit is powered up by 1S and 2S cell of lithium battery.

#### 7. Servo and ESC test Mode

##### Servo test

The input voltage is 5-6V of Servo 5V Power In (NiCd/MH) port, so it could be powered up by 4S NiCd/MH battery pack or

UBEC 5V system. The unit starts to work after connecting power supply properly. The power supply uses Nickel battery port, and screen display Nickel Battery Detect Mode. At this time, it could be confirmed whether the Nickel battery voltage on the screen and working voltage of servo is matched. If not, the power supply for BS Battery Capacity should be changed to the same with power supply for Servo. It may burn up the servo if voltage of power supply and servo doesn't match. After confirming voltage of power supply is correct, connect the 3pin plug to Servo Test PPM OUT port on the top left corner of BS Battery Capacity Meter and make sure to align polarity and signal direction correctly.

Constantly press Cell (Servo Test) button goes to Servo Test Mode. In the Servo Test Mode, the default is test signal by manual-user adjust PPM Adjust button of unit by manual to change Duty Ratio. The adjust range is 500-2500uS or 1000-2000uS, it depends on the setting servo test range by user.

In the Manual Signal Test Mode, It goes into auto. signal test mode by shortly press Cell (Servo Test) or Mode (discharge) button. The Duty Ratio of PPM signal will auto. change from small to large and then large to small circularly. The Duty Ratio changing speed of PPM signal could be changed by users manually adjust PPM Adjust button of unit, to Auto. test and aging the servo tester.

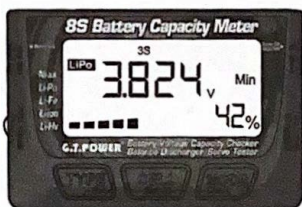
In the Auto. Signal Test Mode, it goes into midpoint signal test mode after shortly press Cell (Servo Test) or Mode (Discharge) button. The duty ratio of PPM signal is constant 1500uS.

**ESC Test**  
 Connect the 3pin plug of ESC to Servo Test PPM OUT port on the top left corner of BS battery Capacity Meter, and make sure to align polarity and signal direction correctly. (BS Battery Capacity Meter is powered up by 5V power supply of BEC from ESC inside, and no need to connect extra power supply) . Constantly press Cell (Servo Test) button and enter to PPM signal output mode. The duty ratio adjustment of PPM signal output is same with Servo Test Mode.

## 8. Function Surface Display Chart



Total voltage and capacity of Lithium Battery



Lowest cell voltage of Lithium Battery



Highest cell voltage of Lithium battery



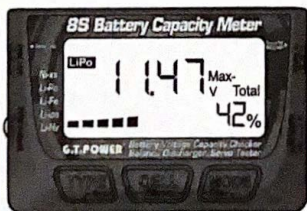
Difference between high and low cell voltage of Lithium battery



Total voltage and capacity of Nickel battery



Discharge Mode of Lithium battery



Balance Mode of Lithium battery



Servo Test Mode