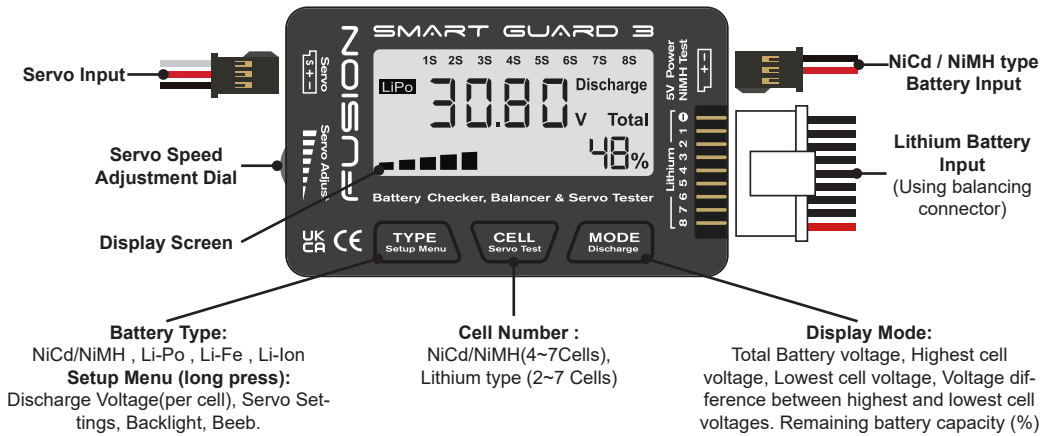


# FUSION SMART GUARD 3

## Battery Capacity Checker, Balancer & Servo Tester



### INTRODUCTION

The Smart Guard 3 is the perfect device for checking the condition of your batteries. It can be used with the most common battery chemistry types found in RC modelling, namely;

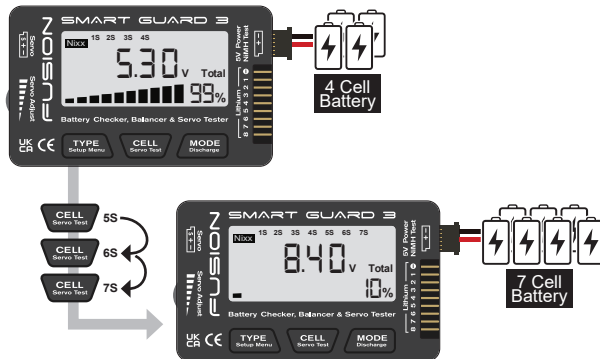
Lithium Chemistry Batteries			Battery Type and Input Cells				
LiPo	LiIon	LiFe	LiPo 1-8S	LiFe 1-8S	Li-Ion 1-8S	Li-HV 1-8S	NiMH 1-8S
Lithium Polymer	Lithium Ion	Lithium Ferrite	✓	✓	✓	✓	✓
			✓	✓	✓	✓	-
			✓	✓	✓	✓	-
			✓	✓	✓	✓	-
			✓	✓	✓	✓	-
			✓	✓	✓	✓	-
			✓	✓	✓	✓	✓

When the Smart Guard 3 is used with 2S-8S Lithium or 4-8 cell Nickel batteries no external power is required for the device to function. If you are checking the condition of a 1S Lithium battery, a 5V external power supply will be required. If you need to test less than 4cell Nickel based battery packs then power from a 2-8S Lithium battery must be connected to provide working power.

### CONNECTING A NICKEL BATTERY

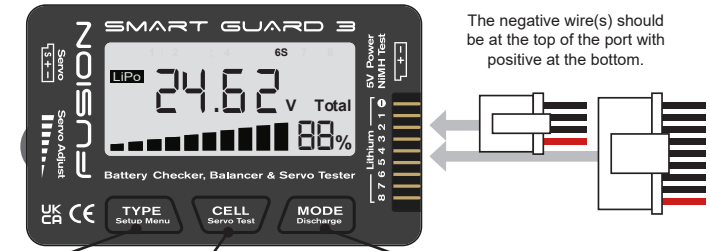
The Nickel based battery connection port is located above the Lithium battery connection port, when connecting a Nickel battery ensure the polarity of the lead is correct before inserting the lead. Both chemistry types can be connected at the same time to the device and is necessary when checking the condition of less than 4 cell Nickel based batteries. If a 5/6/7 cell Nickel battery is connected press the 'CELL' button to select the correct number of cells in the pack to display the pack voltage and remaining capacity %.

**NOTE:** The remaining capacity estimate for the NiCd type cells is not accurate and should not be relied upon.



### CONNECTING A LITHIUM BATTERY

Connect the balance lead of the Lithium battery to the Lithium battery port on the device ensuring the negative wire is aligned with the top pin on the Smart Guard 3 Lithium port. It is necessary to provide 5V power from a Nickel battery when a 1S Lithium battery is connected to provide working power. When connected the Smart Guard 3 will display the number of cells in the pack, total voltage and the capacity remaining of the pack.



Pressing the 'TYPE' Button allows you to select the battery chemistry type.

Pressing the 'CELL' gives you specific details about the highest and lowest voltage in the pack.

Pressing the 'MODE' displays the voltage of each individual cell within the pack.

The 1st screen shows the 'Max' (highest) cell voltage in the pack and which cell this is.

The 2nd screen shows the 'Min' (lowest) cell voltage in the pack and which cell this is.

The final screen shows the voltage difference between the highest and lowest voltage cell.

### LITHIUM BATTERY BALANCE DISCHARGE

When a Lithium battery is connected you can access the balance discharge mode by doing a long press on the 'MODE / Discharge' button followed by a short press, The device will then start to balance with Max-Min flashing.

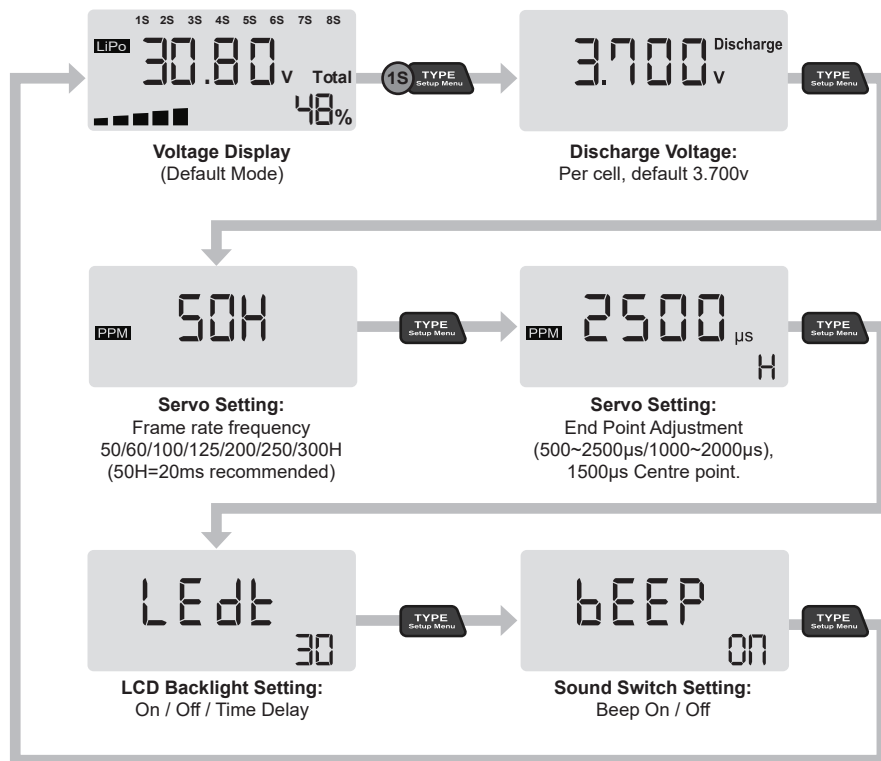
The device will not enter the Discharge mode when the set voltage is higher than the lowest cell reading.

The non-balance 'Discharge' function is a slow discharge function, also controlled by the set voltage.

When all the cells are balanced (within 5mV), or the set voltage is reached, disconnect the battery from the device.

## PARAMETERS AND SETTINGS

Once power is supplied to the device you will be able to cycle through the different functions available. A long press (1 second) of the 'Setup Menu' button will enter the main settings of the device where the default settings can be changed. A short press of the 'Setup Menu' button will scroll through the function available. When within a function a short press of the 'Cell' and 'Mode' button will decrease and increase values respectively.



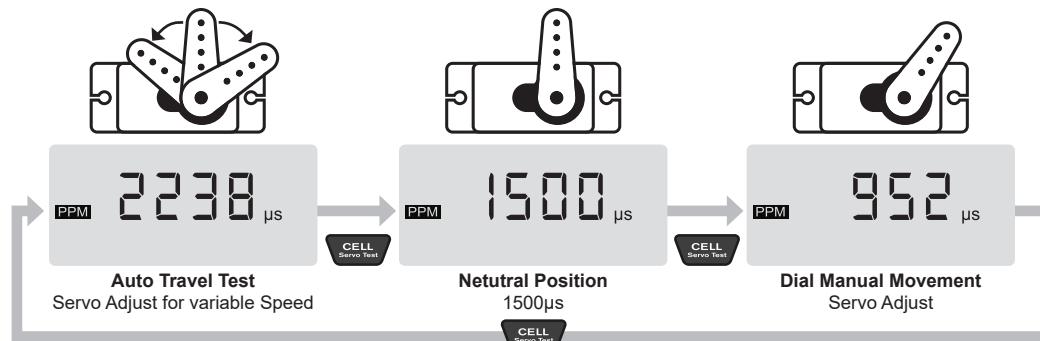
## SERVO TEST MODE

The servo test function requires either a 5-6volt supply or a 4 cell NiMh receiver pack connected into the 'Servo 5V Power In' port, to power the device.



Connect the servo to be tested into the 'Servo Test PPM out' port. A long press on the 'Servo Test' button will enter the servo test function. Further short presses on the 'Servo Test' or 'Mode' buttons will scroll the different functions available:

## SERVO TEST MODE CONTINUED



**NOTE:** If the servo you are testing is installed in a model, please be careful not to exceed travel limits as this may cause damage to your model and/or servo.

## ESC TEST MODE

Connect the ESC's servo lead unit to the 'Servo Test PPM out' port. Power the ESC and turn on, the BEC of the ESC unit will power the device. A long press on the 'Servo Test' button will enter the test function. Further short presses on the 'Servo Test' or 'Mode' buttons will scroll the different functions available:

Auto Travel Test (Servo Adjust for variable speed) / Neutral Position (1500µs) / Dial Manual Movement (Servo Adjust)

We recommend the manual movement on the 'Servo Adjust' dial as some ESC unit require a double reverse command to operate.

**NOTE:** Please ensure the Pinion/Propeller is removed so the model doesn't suddenly move when testing.

## FUNCTIONAL INTERFACE DISPLAY GRAPH

