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SIMBA · DICKIE · GROUP



Operating Manual

**HOT
CHARGER**

Item No. 605012



HT CHARGER

Microprocessor controlled high-performance rapid charger/discharger
For NiCd/NiMH/Li-poly/Pb batteries with cell voltage balancer.
Charge current up to 5A, 1 to 5 series of Li-ion/poly,
1~14 cells of NiCd/NiMH, 6 or 12V lead acid (Pb)

Thank you for purchasing the HT Charger. This is a rapid, computerised charger with a high performance microprocessor, including specialised operating software. This allows your battery to be maintained in optimum and safe condition. Please familiarise yourself with the entire contents of the Operating Manual which contains important programming and safety Information.
This manual needs to be kept in a safe place and be passed on to a new owner in the event of resale.

Special features

-Voltage balancer for Li-polymer battery

The HT Charger has an individual-cell-voltage balancer inside. It does not need a separate balancer when charging Li-poly battery.

-Maximum safety

Delta-Peak sensitivity: The automatic charge termination program works on the principle of the Delta-Peak voltage detection.

Capacity limit: The charging capacity is calculated by a multiple of the charging current and time. If the charging capacity exceeds the limit, the process will be terminated automatically when you set the maximum value.

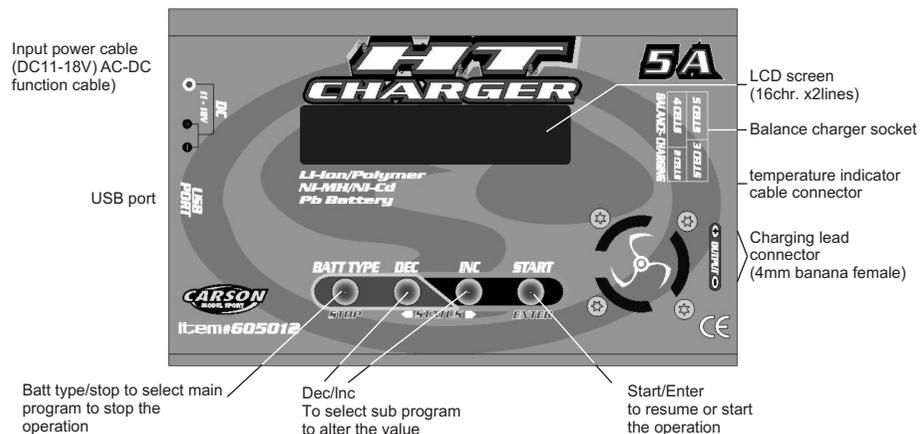
Temperature limit: The temperature of the battery on charging will rise by its internal chemical reaction. If you set a temperature limit the process will be terminated when the limit is reached.

Processing time: You can also restrict the maximum process time to prevent any possible damage.

Input power monitor: To protect the car battery from being damaged (when used as power input) the voltage is always monitored. If it drops below the lower limit the process will automatically be ended.

-High-power and high-performance circuit

The HT Charger employs the circuit that has maximum output power of 50W. As a result it can charge or discharge up to 14 cells of NiCd/NiMH and 5 series of Li-poly batteries with maximum current of 5.0A.



Warnings and safety notes

- Never leave the charge unsupervised when it is connected to its power supply. If any malfunction is observed immediately terminate the process and refer to the operation manual.
- Keep away the unit from dust, damp, rain, heat, direct sunshine and vibration. Do not drop it.
- This unit and the battery to charge or discharge should be set up on a heat-resistant, non-inflammable and non-conductive surface. Never place them on a car seat, carpet or similar combustible surface.
- Keep all the inflammable volatile materials well away from operating area.
- Be sure to understand the technical information of the battery to be charged or discharged accurately. If the program is set up incorrectly the battery could be severely damaged.
- Lithium battery in particular can cause fire or explosion by over-charging.
- To avoid short-circuits between the charge lead, always connect the charge cable to the unit first and only then to the battery to be charged or discharged. Reverse the sequence when disconnecting.
- Do not connect more than one battery pack to the charge lead at any time.

Do not attempt to charge or discharge the following types of batteries:

- 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).
- Batteries that require a different charge technique from NiCd, NiMH, Li-Poly or Pb.
- Faulty or damaged batteries.
- Battery fitted with an integral charge circuit or a protection circuit.
- Batteries installed in a device, or which are electrically linked to other components.
- Batteries that are not expressly stated by the manufacture to be suitable for the currents the charger delivers during the charge process.

Please check the following points before charge operation:

- Did you select the appropriate program, which is suitable for the type of battery?
- Did you set up adequate current for charging or discharging?
- Lithium battery packs can be composed of mixed parallel and series. The composition of the battery pack must be carefully checked before charging.
- Ensure that all connections are firm and safe, and that there are no intermittent contacts at any point in the circuit?

Those warnings and safety notes are particularly important. Please follow the instructions for maximum safety; otherwise the charger and the battery can be severely damaged. Failure to follow these instructions could result in fire, injury or damage to property.

Menu Operation

The charger is operated by consecutive screen menus which are accessed by four push-buttons. You can scroll forwards or backwards from one menu point to the other. After connecting the charger to the power source the menu which was executed as last appears at the screen. By pressing the **BATT TYPE STOP** button you reach the „program select menu“ from where the desired submenus can be attained by pressing the **START ENTER** button.

Program Select
Setup Mode

Adjusting the characteristic user set values

Program Select
Li-Ion/Poly

Charging / discharging Li-Ion/Poly batteries

Program Select
NiMH Batt

Charging / discharging NiMH batteries

Program Select
NiCd Batt

Charging / discharging NiCd batteries

Program Select
Pb Batt

Charging Lead-Acid batteries

Program Select
Save Data

Saving the input values of a battery pack

Program Select
Load Data

Loading the input values of a battery pack

Initial parameter set up

The HT charger will be operated with the default value of the essential user settings when it is started. The screen displays the following information in sequence and the user can change the value of parameter on each screen. When you wish to alter the parameter value in the program, press the **BATT TYPE STOP** button to make it flash then change the value with <DEC or INC> key. The value will be stored by pressing the **START ENTER** button once.

Li-Ion/Poly
U.Type 3.7V

Type of the Lithium-Ionen /-Polymer-Battery.

To determine the full charge of any Lithium-Battery a very precise value of their voltage is necessary. This can be adjusted here between 3.6V and 3.7V. The value is then used in all subsequent operations.

NiMH Sensitivity
D.Peak Default

Sensitivity of Delta-Peak recognition for NiMH.

This value is factory set (Default). After pressing the **START ENTER** key the value for Delta-Peak cut-off can be set between 5 and 20 mV per cell. By doing so you may prevent a premature cut-off before full charge is reached. This operation must be handled with care and it is suggested to set an additional limit for the charging capacity (maximum 1.4 x nominal value).

NiCd Sensitivity
D.Peak Default

Sensitivity of Delta-Peak recognition for NiCd. Operating instructions are the same as NiMH.

NiCd Sensitivity
D.Peak 5mV/Cell

High temperature cut-off.

Temp Cutoff
ON 80C

An upper limit for the temperature of the battery can be entered here. Charging is finished if this limit is exceeded.

To use this function a separately available temperature indicator cable item No. 605015 is required. The function can be switched ON or OFF.

Wait Time
CHG>DSCG 1min

Waiting time for cyclical charging/discharging.

During discharge a battery gets hot according to the value of the discharging current. If charged immediately after discharging the battery does not reach its full capacity. It is possible here to enter a waiting time (time to cool) in case of cyclical battery regeneration with several charge and discharge cycles.

NiMH/NiCd/Pb
Trickle 50mA

Charging maintenance at low current for NiMH/NiCd/Pb.

This function is not used for LiPo. To maintain a high charging level of a battery (i.e. to counteract self-discharging) a NiMH/NiCd/Pb-battery can remain connected to the charger whilst accepting a low current. It should be specifically noted that this is not valid for LiPo batteries, which have a very low self discharging characteristic. The current value for maintenance should be about 0,05C. Damage to the battery pack (overheating, shortening of lifetime, memory effect etc.) should not occur.

```
Safety Timer  ON      240min
```

When you start a charge process, the integral safety timer automatically starts running at the same time. This is programmed to prevent overcharging of the battery if it proves to be faulty, or if the termination circuit can not detect that the battery is full. The value for the safety timer should be generous enough to allow a full charge of the battery.

```
Capacity Cutoff  ON      5000mAh
```

This program sets the maximum charge capacity that will be supplied to the battery during charge. If the Delta-Peak voltage is not detected nor the safety timer expired by any reason, this feature will automatically stop the process at the selected capacity value.

```
Key Beep      ON  
Buzzer        ON
```

A beep sounds at every time pressing the buttons to confirm your action. The beeps or melodies sound at various times during operation as reference to different mode changes. These audible sounds can be switched on or off.

```
Input Volt Low  Cutoff  10.0V
```

This program monitors the voltage of input battery. If the voltage drops below the value you set the operation is forcibly terminated to protect the input battery.

```
Backlight      50%
```

You can adjust the brightness of the LCD screen at the charger.

Charging / Discharging of Lithium polymer batteries

These programs are only suitable for charging and discharging Lithium-polymer batteries with a nominal voltage of 3.7V/cell only. These batteries need to adopt a different charge technique which is referred to as a constant voltage and constant current method. The charge current varies according to the battery capacity, and is usually C/2 rate (half capacity of the charge current). The final voltage of charge process is also very important, which should be 4.2 V/cell for the nominal voltage of 3.7V/cell. If the final voltage is exceeded by more than 1% during charge for any reason the battery will explode. The charge current and nominal voltage per cell count, set on the charge program, must always be correct for the battery to be charged.

If you wish to alter the parameter value in the program, press the START ENTER key to make it flash then change the value with <DEC or INC> key. The value will be stored by pressing the START ENTER key once.

```
Li-Poly Charge  1.0A  11.1V(3S)
```

The value on the bottom left hand side sets the charge current and the value on the bottom right hand side sets the voltage of the battery pack. After setting the current and voltage press the START ENTER key for more than 3 seconds to start the process (charge current: 0.1-5.0A voltage: 1-5 series).

```
Li-Poly Charge  1.0A  AUTO
```

Automatic voltage detector. Instead of voltage and number of series the display can show on the lower right hand side: "AUTO". If you switch on this mode the charger automatically detects the voltage of the LiPo battery pack and the number of the cells. You only have to adjust the charging current. This is also valid in balancing mode.

```
R: 2Ser  S: 2Ser  
Confirm(ENTER)
```

This shows the number of cells you set up and the processor detects, 'R:' which shows the number of cells found by the charger and 'S:' which is the number of cells selected by you at the previous screen. If both numbers are identical you can start charging by pressing the START ENTER button. If not, press the BATT TYPE STOP button to go back to previous screen. Then carefully check the number of cells of the battery pack to charge again. This screen does not appear if you choose "AUTO" in the previous screen.

```
Li2S CHG 0075mAh  
7.42V 1.0A 5m
```

The screen shows the current status of the charging process.

To stop charging press the START ENTER key once.

Discharging Li-Po Batteries

```
Li-Poly Dischg  
2.0A 9.00V(3S)
```

Lithium batteries do not have the so called „lazy battery effect“ which appears exclusively with NiCd or NiMH batteries when they are charged in only partially discharged condition. Lithium batteries should be discharged only in exceptional cases for instance if they have to be disposed or if after a long period of use, the capacity of a full charge needs to be determined. The current must be chosen according to the battery, the final discharge voltage is 3V/cell. The discharge is automatically terminated and is indicated visually and acoustically.

Charging Li-Poly battery in balancing mode

This is for balancing the voltage of lithium batteries of the battery pack to be charged. To do this, the battery pack being charged should have an individual cell connector, which should be connected to the individual port at the right side of charger. You do not need to connect the battery output jack to the output of charger on this setting.

In this mode the charging process will be different from ordinary charging mode. The internal processor of the charger will monitor the voltage of each cell of the battery pack and control the charging current feeding each cell to balance the voltage.

```
Li-Poly Bal. Chg  
1.0A 11.10V(3S)
```

The value on the bottom left hand side sets a charge current and the value on the bottom right hand side sets the voltage of the battery pack.

After setting the current and voltage press the **START ENTER** key for more than 3 seconds to start the process. (Charge current: 0.1-5.0A voltage: 1-5 series)

```
R: 2Ser S: 2Ser  
Confirm(ENTER)
```

This shows the number of cells you set up and the processor detects. 'R:' which shows the number of the cells found by the charger and 'S' which is the number of cells selected by you at the previous screen; if both numbers are identical you can start charging by pressing the **START ENTER** key. If not, press **BATT TYPE STOP** button to go back to previous screen. Then carefully check the number of cell of the battery pack to charge again.

```
Li2S CHG 0005mAh  
7.42V 1.0A 5m
```

The screen shows the present situation during the charging process. To stop charging press the **BATT TYPE STOP** key once.

```
4.17V4.17V 4.17V  
0.4A 0.00V 0.00V
```

Determining the voltage of individual cells. You can monitor the present voltage of individual cell by pressing <DEC or INC> button during the process.

The first line of display shows the voltage of no.1 cell, no.2 cell and no.3 cell from the left. The bottom left hand side shows the charging current. The next two figures denote the voltage of no.4 and no.5 cell.

Ni-MH/NiCd battery charging program

These programs are for charging NiMH (Nickel-Metal Hydride) or NiCd (Nickel-Cadmium) battery packs, which are commonly used for R/C models. For quick-charge batteries the chosen current should be as high as possible; this has a positive effect on the available power. Pay attention to the Manufacturer's instructions. Charging and discharging operations for NiMH or NiCd batteries are basically similar. Different Delta-Peak characteristics mean that adjusting the battery type correctly is critical.

```
NiMH Charge  
Current 0.3A
```

To change the value of the charging current push the **START ENTER** button to make the number flash and then change the value with the <DEC or INC> button. The value is saved by pressing the **START ENTER** button once more.

This program charges the battery with the current that you have adjusted until the Delta-Peak function detects that the battery is full. The charge current reaches from 0,1A to 5,0A but is also dependant on the number of cells.

```
-- Battery --  
CHECK
```

To start charging push the **START ENTER** button for more than 3 seconds. A battery check notice appears momentarily on the screen.

```
NiMH CHG 0254mAh  
8.47V 3.0A 5m
```

The screen displays the current state of charging. To stop the process, press the **BATT TYPE STOP** key once. An audible sound indicates the end of process.

Discharging NiMH/ NiCd batteries

```
NiMH Discharge  
0.3A 9.8V
```

Under certain circumstances NiMH and NiCd batteries can develop a so called „lazy battery effect“ if they are charged frequently without being discharged completely. This causes a partial loss of capacity. It is therefore necessary to discharge this type of battery from time to time, to a voltage of 1 Volt per cell (for a battery pack with 6 cells 6 Volt) because it is not totally discharged under regular running or flying. The following charging cycle will provide a true indication of the battery's capacity.

```
NiCd DSC 0754mAh  
6.47V 3.0A 15m
```

Regeneration cycle for NiMH and NiCd batteries

```
NiMH Cycle  
DSCG>CHG 1
```

NiMH and NiCd batteries which have not been used for a longer time cannot yield full power after a single charge. Power can be increased by repeated charging / discharging.

With a charge/discharge or discharge/charge cycle this procedure can be repeated automatically up to 5 times. The number of cycles (1-5) and starting with charging or discharging can be chosen.

```
C>D 1 0045mAh  
9.14V 0.3A 5m
```

The screen information is very similar to charging.

Pb (lead-sulphuric acid) battery charging program

This program is for charging Pb (lead-acid) battery with a nominal voltage of 6 or 12V. Pb batteries are totally different from NiCd or NiMH batteries. They can only deliver relatively low current compared to their capacity, and similar restrictions apply to their charging abilities. So the optimum charge current will be 1/10 of the capacity. Pb batteries must not be fast charged. Always follow the battery Manufacturer's instructions.

```
Pb Charge
3.0A          6.0V
```

Set up the charge current on the left and the nominal voltage of the battery on the right. The charge current ranges from 0.1 to 5.0A and the voltage should match with the battery being charged. Start the charge process by pressing the **START** **ENTER** key for more than 3 seconds.

```
Pb   CHG 0263mAh
6.28V 3.0A   5m
```

The screen displays the state of the charging process. To stop charging forcibly, press **BATT TYPE** **STOP** key once. The audible sound indicates the end of process.

Saving and loading data of up to 10 different battery types

The essential data of up to 10 different batteries can be stored in the memory.

```
Save [01]  NiCd
7.2V      2000mAh
```

Saving battery charge details

Memory number identity, the type of the battery, the voltage, and the capacity are all adjustable. When all values are adjusted according to the battery, press the **START** **ENTER** button for more than 3 seconds but release it instantly when the audible signal sounds. On the following screen you have the possibility to adjust the charging current; which is marked by a flashing star. The next screen shows the display on the left together with an acoustic signal and the values are saved.

```
NiCd Charge *
Current      0.3A
```

```
Save...
```

```
Load [01]  NiCd
7.2V      2000mAh
```

Loading a saved battery configuration

After choosing the memory number the battery charging data is shown in the display. Now press the **START** **ENTER** button for more than 3 seconds; a short notice appears together with an acoustic signal. The automatically set value of the charging current is displayed (which can be adjusted) and charging can be started.

```
Load...
```

```
NiMH Charge
Current      0.3A
```

Warning and error messages

The HT Charger incorporates a various functions of protective and monitoring to verify functions with its state of the art electronics. Should an error occur, the screen displays a self-explanatory error message with an audible sound.

```
Reverse Polarity
```

The output is connected to a battery with incorrect polarity.

```
Connection Break
```

This will be displayed in case of detecting an interruption between battery and output or voluntarily disconnecting the charge lead during the operation of charge or discharge on output.

```
SHOT ERR
```

There was a short-circuit at output.

```
Low Input Vol
```

The voltage input is too low.

```
VOL SELECT ERR
```

The Lithium battery pack voltage was selected incorrectly. Verify the voltage of the battery pack carefully.

```
BREAK DOWN
```

The unit has malfunctioned.

```
BATTERY CHECK
LOW VOLTAGE
```

The processor has detected a low voltage irregularity during charging.

```
BATTERY CHECK
OVER VOLTAGE
```

The processor has detected a high voltage irregularity during charging.

```
BATTERY VOL ERR
```

The voltage of one cell in the Li-poly battery pack has exceeded the limit.

Specifications

Operating voltage range:	11.0 - 18.0 Volt max.
Circuit power:	50W
Charge current range:	0.1 - 5.0A
Current drain for balancing Li-po:	200 mAh/cell
NiCd/NiMH battery cell count:	1 ~ 14 cell
Li-Ion/Polymer cell count:	1-5 series
Pb battery voltage:	2 to 12V
Weight:	350g
Dimensions:	130X90X28mm

Connection to a computer via USB cable

The charger features a USB connector where it can be connected to a computer. Use the approved software to create charging and discharging graphics, offering more extensive information than is available with the standard display.

This accessory is suitable for expert modellers who participate at competitions and therefore need very precise information of their battery's power. The software available in English.

USB cable with battery check software Item No. 605013.

Declaration of conformity

In accordance with guidelines 1999/5/EG (R&TTE)

Dickie-Tamiya GmbH&Co KG hereby declares that this charger is in accordance with the basic requirements and other relevant regulations of guideline 1999/5/EG.

The original declaration of conformity can be obtained from the following address:

Dickie-Tamiya GmbH&Co. KG • Werkstraße 1 • D-90765 Fürth • Tel.: +49/(0)911/9765-03



Disposal

Please note and understand the symbols on this product, packaging or instructions. Electronic components are valuable materials and at the end of their useful life should not be disposed with household waste! Help us to protect the environment and safeguard our resources by discarding this equipment at a dedicated recycling point. The authority responsible for waste disposal or your retailer will be able to answer any questions you may have in this respect.



Limited Warranty

This product is warranted by CARSON against manufacturing defects in material and workmanship under normal use for 24 months from the date of purchase from authorized franchisees and dealers. In the event of a product defect during the warranty period, take the product and the CARSON sales receipt as proof of purchase date to any CARSON store. CARSON will, at its option, unless otherwise provided by law:

- (a) correct the defect by product repair without charge for parts and labor;
- (b) replace the product with one of the same or similar design; or
- (c) refund the purchase price.

All replaced parts and products, and products on which a refund is made, become the property of CARSON. New or reconditioned parts and products may be used in the performance of warranty service. Repaired or replaced parts and products are warranted for the remainder of the original warranty period. You will be charged for repair or replacement of the product made after the expiration of the warranty period.

This warranty does not cover:

- (a) damage or failure caused by or attributable to acts of God, abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation or maintenance, alteration, lightning or other incidence of excess voltage or current;
- (b) any repairs other than those provided by a CARSON Authorized Service Facility;
- (c) consumables such as fuses or batteries;
- (d) cosmetic damage;
- (e) transportation, shipping or insurance costs; or
- (f) costs of product removal, installation, set-up service adjustment or reinstallation.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.