



OVERLOADER

Instruction Manual



Introduction

Thank you for purchasing this high-end competition charger. This charger is a high performance computerized battery maintenance system. Capable of charging, discharging, cycling and conditioning multiple rechargeable battery types, with very high output power, a customized display with expertly designed software and programming controls, the Overloader is easily one of the smartest and most powerful R/C battery maintenance systems available!

NOTE: You will find a transparent protective plastic film on the front plate. Please remove this film before the first usage.

Special features

- Perfect for electric cars, trucks, boats and airplanes
- Handling NiCd / NiMH / Li-Ion / Li-Po battery types
- 8 line, 21 character large graphic LCD can allow very much information to be viewed
- Graphical display show charge and discharge curves
- Storing up to 10 different battery configurations for instant and easy recall. Charger setup can allow you to customize your battery profile
- Performs 1 - 10 cycles for NiCd / NiMH only, and stores capacity and voltage date for all 10 cycles
- Top off charge can allow NiMH batteries to be fully charged without overheating.
- Reserve time function is designed to fully charge a battery pack right before the start of a race
- Break-in electric motors (1.0 - 8.0 V, 10A constant) or operate commutator lathes
- Intuitive program menus and simple pushbutton control
- Intelligent cooling fan control system for better charge efficiency and extended charger life
- LCD contrast, fan operation, temp scale and sound cues are fully adjustable
- Various warning messages for improper input voltage, wrong connections, unsuitable battery condition or reverse polarity on output
- Packaged in a rugged, extruded aluminium case

Precautions !

- Do not charge or discharge battery types other than nickel-cadmium (NiCd), nickel-metal hydride (NiMH), Lithium-Ion (Li-Ion) or Lithium-Polymer (Li-Po) rechargeable batteries. Damage may occur from other types of batteries.
- Do not attempt to charge batteries at excessive fast charge currents.
- Do not use automotive type battery chargers to power the charger.
- Do not leave the charger unattended while charging. Disconnect the battery and remove input power from charger immediately if the charger becomes hot.
- Allow the charger or battery to cool down before reconnecting.
- Do not allow water, moisture or foreign objects into the charger.
- Do not place the battery or the charger on or near a flammable object while in use. Keep away from carpets, cluttered workbenches, etc.
- Do not cover the air intake holes on the charger as this could cause the charger to overheat.
- Always disconnect charger from power source when not in use.

Safety note for Li-Ion and Li-Po batteries !

- Do not allow Li-Ion or Li-Po batteries to overheat!
- It is very important to know the battery's nominal rated voltage before charge or discharge.
Li-Po batteries: 2-cell pack wired in series -> total voltage will be 7.4 V (2x 3.7V)
Li-Ion batteries: 2-cell pack wired in series -> total voltage will be 7.2 V (2x 3.6V)
- ALWAYS make sure to set the correct Li-Ion or Li-Po battery voltage (3.6V per cell for Li-Ion and 3.7V per cell for Li-Po)
- Do not attempt to use the NiCd or NiMH mode for Li-Ion or Li-Po batteries.
- Do not attempt to charge Li-Ion or Li-Po batteries at greater than "1C" rating of the battery.
- Do not attempt to repeatedly charge Li-Ion or Li-Po batteries.
- If Li-Ion or Li-Po batteries overheat, please immediately disconnect batteries from the charger!

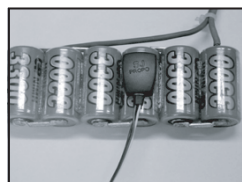
Specification

	Type	Description	Step
Input voltage	DC Input	11 ~ 15V	
Battery types		NiCd, NiMH, Lilo,LiPo	
Operating mode	NiCd , NiMH	Charge, Discharge, and Cycle	
	Lilo,LiPo	Charge and discharge	
Function	Charge	Automatic charge Linear charge Re-flex charge 4-step charge Impulse charge Reserve Timer	
	Discharge	Automatic discharge Manual discharge	
Cell numbers	NiCd / NiMH	1 ~ 10Cell	Cell
	Lilo,LiPo	1 ~ 4Cell	Cell
Fast charge current	NiCd , NiMH	0.1A ~ 8.0A	100mA/step
	Lilo,LiPo	Capacity 1C limited	100mA/step
Max charge capacity (safety timer)	NiCd , NiMH	10 ~ 150%	10%/step
	Lilo,LiPo	10 ~ 120%	10%/step
Top-off charge	NiCd , NiMH	off ~ 1000mAh	100mA/step
Pre-peak delay time	NiCd , NiMH	1 ~ 10 min	1min/step
Discharge current	NiCd , NiMH	0.1A~20.0A	100mA/step
		1 ~ 6cell	20.0Amax limited
		7cell	17.0Amax limited
		8cell	15.0Amax limited
		9cell	13.5Amax limited
		10cell	12.0Amax limited
	Lilo,LiPo	Capacity 2C limited	100mA/step
Discharge Voltage	NiCd, NiMH	0.1 ~ 1.1V	0.1V/step
	Lilo,LiPo	2.5 ~ 3.7V	0.1V/step
Charge/Discharge Limit	Charge	120W Limited	
	Discharge	180W Limited	
Trickle currnet	NiCd / NiMH	off~500mA	50mA/step
		Auto(charge current/20)	
Cycle mode (NiCd/MH only)	Cycle time	1~10time	1time/step
	Charge after delay	1~30min	1min/step
	Discharge after delay	1~30min	1min/step
	Cycle direction	C→D / D→C / (D)→C→D	
Peak sensitivity	NiCd	5 ~ 25mV/cell	1mV/step
	NiMH	ZERO, 3 ~ 15mV/cell	1mV/step
Temperature Sensor	Centigrade	10 ~ 55°C	1°C/step
	Fahrenheit	50 ~ 132°F	2°F/step
	Setting Voltage	1.0~8.0V	0.1V/step
Motor Break-in	Run Time	0~24 hours	1second/step
	Max current	30A	
	Continuous current	10A	
FAN control		On, Auto	0n/Auto
Memory		10 memory	
Display Type	LCD	customer name setup 128 x 64 Graphic LCD	
	Switch button	On/off	On, off
Buzzer	Finish Sound	Off ~ 3min	
	Melody	1 ~ 5	
Case Type		Aluminum	
Cooling System		AL.heat-sink 40mm DC FAN X 3	
Input Type	Wire	DC Input Cable	
Output Type		Banana jacks	

Charger controls & connections



There are banana plugs on the input power leads and additional alligator clips which have a female banana jack inside. So you are able to use nearly all various power sources for the charger.



Temp sensor with a magnet can be accurately attached at the battery pack.

● Control buttons



Main menu

```
[0]Memory Name...
NiCd 00cell 0000mAh
chg current : 0.0A
dchg current: 0.0A
dchg current: 0.0A
peak sens.  : 0mV/C
dchg volt   : 0.0V/C
trickle curr: 0.00mA
```



```
[ STEP CHARGE SETUP ]
00cell 00mV/C 000°F
[Bar chart with 4 bars of varying heights]
0000 0000 0000 0000
0.0A 0.0A 0.0A 0.0A
```



```
[ MOTOR Break-in ]
set volt : 0.0V
set time : 00:00:00

TIME      : 00:00:00
VOLTAGE   : 0.00V
CURRENT   : 0.00A
```



```
[ USER SETUP ]
fan control : on
temp.mode   : °F
button sound : on
finish sound : 10sec
melody      : 1
LCD contrast : 10
< User Name...
```



```
[ Data View ]
input volt : 0.000V
output     : 0.000V
batt.temp  : 0.0 °F
peak temp  : 0.0 °F
bat res.   : 0mR
chg time   : 0s
dchg time  : 0s
```



```
[ CYCLE DATA ]
NO CAPACITY VOLTAGE
1 C: 0mAh 0.000V
D: 0mAh 0.000V
2 C: 0mAh 0.000V
D: 0mAh 0.000V
3 C: 0mAh 0.000V
D: 0mAh 0.000V
```



● MEMORY DATA setup screen

- Set charge or discharge methods in this screen.
- Store selected parameters in the memory or recall parameters stored in memory.

● FOUR-STEP charge setup screen

- Four-Step charge parameters are set in this screen.

● Motor break-in setup screen

- Motor break-in is set in this screen.

● User setup screen

- User setup data is set in this screen.

● Data view screen

- The data of the battery and system can be seen in this screen.

● Cycle data screen

- Battery data can be seen after cycle operation in this screen.

Memory data setup

● Selecting memories

- Select the desired memory with the and buttons.
- Memory range: 0 - 9 (total 10)

```
[0] Memory Name...
NiCd 00cell 0000mAh
chg current : 0.0A
dchg current: 0.0A
dchg current: 0.0A
peak sens.  : 0mV/C
dchg volt   : 0.0V/C
trickle curr: 000mA
```



```
Memory name set-up
[0] Memory Name...
^
ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefg
hijklmnopqrstuvwxyz 0123456789 -.'
```

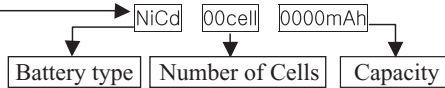
● Naming memories

- Locate a letter with the and buttons.
- Select a desired letter with the and buttons.

```
[0] Memory Name...
NiCd 00cell 0000mAh
```

```
[0] Memory Name...
NiCd 00cell 0000mAh
chg current : 0.0A
dchg current: 0.0A
dchg current: 0.0A
peak sens.  : 0mV/C
dchg volt   : 0.0V/C
trickle curr: 000mA
```

● Selecting the battery type



- Highlight the battery type with the button.
- Select the desired battery type with the and buttons.
- Battery types: **NiCd, NiMH, Li-Ion, Li-Po**
- Highlight the number of cells (for NiCd/NiMH) or total voltages for (Li-IOn/Li-Po) with the button.
- Select the desired number of cells or total voltages with the and buttons.
- Number of cells: 1 - 10 (NiCd & NiMH), 1 - 4 (Li-Ion & Li-Po)
- Highlight the pack capacity with the button.
- Select the desired capacity with the and buttons.
- Capacity: 100 - 9900mAh

```
[0] Memory Name...
NiCd 00cell 0000mAh
no.of cycles : 0time
D > C delay : min
D > C delay : min
cycle mode  : C>D
max chg capa : 000%
peak delay  : 00min
```

Within the Memory data setup screen, to move the cursor up or down, press the or buttons. Highlight the adjustable value with the button, then adjust the highlighted value with the and buttons.

To confirm the selection, press the button.

● Charge current

- Set a charge current from 0.1A to 8.0A
- WARNING: For safety purposes, the max. charge current for Li-Ion / Li-Po is limited to “1C” rate.

● Discharge current

- Set a discharge current from 0.1A to 20.0A

- WARNING: For safety purposes, the max. discharge current for Li-Ion / Li-Po is limited to “2C” rate.

● **Peak Sensitivity (NiCd & NiMH only)**

- Set the peak sensitivity for NiCd & NiMH batteries only.
- The range is 5-25mV per cell for NiCd batteries and 3-15mV per cell for NiMH batteries.
- For NiMH batteries the setting “Zero Volt Delta Peak” is also available.

● **Discharge cutoff voltage**

- The adjustable range for NiCd & NiMH is 0.1 - 1.1V per cell and the range for Li-Ion & Li-Po is 2.5 - 3.7V per cell (a setting of 2.8 - 3.0V is recommended).

● **Trickle charge current (NiCd & NiMH only)**

- The range of the trickle charge current is 0 - 500mA.
- Even if trickle charge is set, the trickle charge will not work if fast charge is not completed by delta peak or temp cutoff.
- If fast charge is stopped because the battery temperature reached the user selected temperature, trickle charge will not begin until the battery temperature drops about 2°C below the user selected temperature.

● **Cutoff temperature**

- Set the cutoff temperature of the battery between 10°C and 55°C.

● **Number of cycles (NiCd & NiMH only)**

- Set the number of cycles from 1 to 10 times.

● **Cycle delay Charge to Discharge**

- This sets a time delay for NiCd & NiMH batteries between charge and discharge during cycling from 1 - 30 minutes.

● **Cycle delay Discharge to Charge**

- This sets the time delay between discharge and charge.

● **Cycle Mode**

- This sets the cycle pattern:
 - 1) C --> D : Discharge after charge
 - 2) D --> C : Charge after discharge
 - 3) (D) C --> D : Discharges first remaining capacity, then starts charge to discharge.

- **Maximum charge capacity**

- This sets the maximum amount of battery capacity from 10 - 150% for NiCd & NiMH batteries and 10 - 120% for Li-Ion & Li-Po batteries.
- Set the maximum charge capacity by percentage (%) against the selected battery capacity.
- For example, if battery capacity is set to 3000mAh, and if the max. charge capacity percentage is set to 120%, the max. charge capacity will be 3600mAh.
- Factory default is set to 150% for NiCd/NiMH and 120% for Li-Ion/Li-Po.
- It is recommended to set the max. charge capacity to 130% for NiCd/NiMH and 110% for Li-Ion and Li-Po batteries.

- **Peak delay (NiCd & NiMH only)**

- The charger does not start the peak detection at the beginning of charge to prevent the charger from accidentally stopping too early.
- The adjustable range of the peak delay is 1 - 10 minutes.

- **Top-off charge (NiMH only)**

- The Top-off charge is activated after fast charge is finished in normal and reflex charge modes only.
- The Top-off charge is designed to fill the pack to maximum capacity more quickly.
- If this feature is set, it should automatically start 5 minutes after the fast charge is finished.

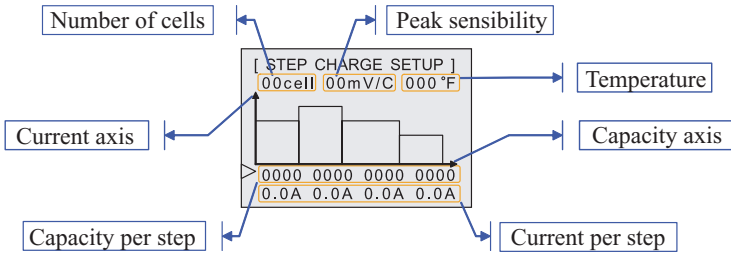
● Parameters for each battery type

Parameter	NiCd	NiMH	Li-Ion	Li-Polymer
Battery cells	1 ~ 10 cell	1 ~ 10 cell	3.6V,7.2V, 10.8V,14.4V	3.7V,7.4V, 11.1V,14.8V
Capacity	100 ~ 9900mAh	100 ~ 9900mAh	100 ~ 9900mAh	100 ~ 9900mAh
Charge current	0.1 ~ 8.0A	0.1 ~ 8.0A	0.1 ~ 8.0A (1C Limited)	0.1 ~ 8.0A (1C Limited)
Discharge current	0.1 ~ 20.0A	0.1 ~ 20.0A	0.1 ~ 20.0A (2C Limited)	0.1 ~ 20.0A (2C Limited)
Peak sensitivity	5 ~ 25mV/cell	3 ~ 15mV/cell, Zero Delta Peak	X	X
Discharge voltage	0.1 ~ 1.1V/cell	0.1 ~ 1.1V/cell	2.5 ~ 3.7V/cell	2.5 ~ 3.7V/cell
Trickle charge current	0 ~ 500mA 50mA/step	0 ~ 500mA 50mA/step	CV charge trickle	CV charge trickle
Temperature cut-off	10 ~ 55℃ 1℃/step	10 ~ 55℃ 1℃/step	10 ~ 55℃ 1℃/step	10 ~ 55℃ 1℃/step
	50 ~ 132°F 2°F/step	50 ~ 132°F 2°F/step	50 ~ 132°F 2°F/step	50 ~ 132°F 2°F/step
No of cycles	1~10	1~10	X	X
Charge after delay time	1 ~ 30 min 1min/step	1 ~ 30 min 1min/step	X	X
Discharge after delay time	1 ~ 30 min 1min/step	1 ~ 30 min 1min/step	X	X
Cycle direction	C→D , D→C, (D)C→D	C→D , D→C, (D)C→D	X	X
Max charge capacity	10 ~ 150% 10%/step	10 ~ 150% 10%/step	10 ~ 120% 10%/step	10 ~ 120% 10%/step
Pre-peak delay	1 ~ 10min 1min/step	1 ~ 10min 1min/step	X	X
Top off charge current	Off ~ 1000mA 100mA/step	Off ~ 1000mA 100mA/step	X	X

Four-Step charge setup

The Four-Step charge method is designed for very high charge efficiency for NiMH batteries. This charge method is only recommended for experienced users. Setting incorrect values can cause permanent damage to the battery!

● Four-Step charge setup screen (#1)



- ① - Within the Four-Step setup screen, if the button is pressed, the number of cells will be highlighted.

00cell 00mV/C 000°C

- Set the desired number of cells (1 - 10) with the & buttons.
- Press the button to confirm the selection and to highlight the peak sensibility value.

00cell **00mV/C** 000°C

- Set the desired peak sensibility value with the & buttons.
- Press the button to confirm the selection and to highlight the temperature setting.

00cell 00mV/C **000°C**




- Set the desired temperature value with the & buttons.

- ② - If the button is pressed, it causes the cursor to move down to the capacity line.
 - To highlight the capacity value for step 1, press the button.




0000 0000 0000 0000

- Set the desired capacity value for step 1 with the & buttons.
- Press the button to confirm the selection and to highlight the capacity value for step 2.




0000 0000 0000 0000



- Set the desired capacity value for step 2 with the  &  buttons.
- Press the  button to confirm the selection and to highlight the capacity value for step 3.

0000 0000 0000 0000




- Set the desired capacity value for step 3 with the  &  buttons.
- Press the  button to confirm the selection and to highlight the capacity value for step 4.

0000 0000 0000 0000




- Set the desired capacity value for step 4 with the  &  buttons.
- Press the  button to confirm the capacity settings.

- ③ - If the  button is pressed, it causes the cursor to move down to the current line.
- To highlight the charge current value for step 1, press the  button.




0.0A 0.0A 0.0A 0.0A

- Set the desired charge current for step 1 with the  &  buttons.
- Press the  button to confirm the selection and to highlight the charge current for step 2.




0.0A 0.0A 0.0A 0.0A


- Set the desired charge current for step 2 with the  &  buttons.
- Press the  button to confirm the selection and to highlight the charge current for step 3.

0.0A 0.0A 0.0A 0.0A

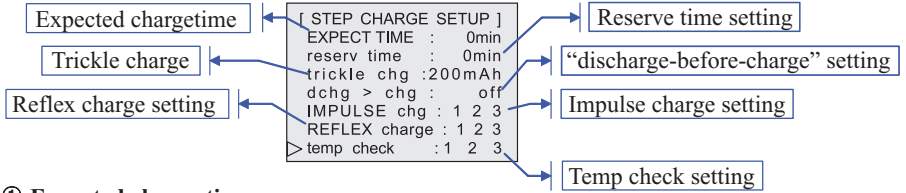
- Set the desired charge current for step 3 with the  &  buttons.
- Press the  button to confirm the selection and to highlight the charge current for step 4.

0.0A 0.0A 0.0A 0.0A

- Set the desired charge current for step 4 with the  &  buttons.
- Press the  button to confirm the charge current settings.

- - If the  button is pressed, it causes the cursor to move down to the Four-Step charge setup screen (#2).

● Four-Step charge setup screen (#2)



① Expected charge time

- The charger will calculate how much time is expected to fully charge the battery within four-step charge mode based on user selected battery capacity and charge current.

- Move the cursor to the wanted location with the & buttons and highlight the desired value with the button.

② Reserve time setting

- Set the reserve time to be the number of minutes with the & buttons before the next race starts plus enough time to get the battery into the car and go to the track.
- It is recommended to set the reserve time after setting other parameters in the main Four-Step charge mode.
- The minimum reserve time setting can not be lower than the calculated expected time, the maximum is 600 minutes.
- The reserve time does not include the time which is needed for “discharge-before-charge”.
- It is important to know that the reserve time will vary depending on the charger current selection, capacity rating of the battery, etc...

③ Trickle charge setting



- Set the trickle charge current from 0 to 500mA with the & buttons.


④ “discharge-before-charge”


- Select on or off for “discharge-before-charge” with the & buttons.
- It is recommended to set “on” to empty the battery before starting Four-Step charge.
- Otherwise please only connect a fully discharged battery for charging with Four-Step mode.


⑤ IMPULSE charge setting



- Set the impulse charge in steps 1, 2 or 3.
- For further details on the impulse charge, refer to Charge modes (page 29).
- While the cursor is indicating the impulse charge, if the button is pressed, it indicates step 1.


Select or de-select “1” with the  &  buttons.


 : Impulse is de-selected in step 1.


 : Impulse is selected in step 1.



To confirm the selection for step 1 and to move the cursor to step 2, press the  button.


Select or de-select “2” with the  &  buttons.


 : Impulse is de-selected in step 2.

 : Impulse is selected in step 2.


To confirm the selection for step 2 and to move the cursor to step 3, press the  button.


Select or de-select “3” with the  &  buttons.

 : Impulse is de-selected in step 3.

 : Impulse is selected in step 3.


⑥ REFLEX charge setting


- Set the reflex charge in steps 1, 2 or 3.
- For further details on the reflex charge, refer to Charge modes (page 29).
- While the cursor is indicating the reflex charge, if the  button is pressed, it indicates step 1.

Select or de-select “1” with the  &  buttons.


 : Reflex is de-selected in step 1.


 : Reflex is selected in step 1.



To confirm the selection for step 1 and to move the cursor to step 2, press the  button.

Select or de-select “2” with the  &  buttons.


 : Reflex is de-selected in step 2.

 : Reflex is selected in step 2.


To confirm the selection for step 2 and to move the cursor to step 3, press the  button.



Select or de-select “3” with the  &  buttons.


 : Reflex is de-selected in step 3.


 : Reflex is selected in step 3.


⑦ Temperature check



- The temperature sensor must be connected to the charger before the four-step charge mode can be used.
- In step 1 - 3, if the battery's temperature reaches the temperature setting at the top of the four-step charge screen, the charger will pause the charge until the battery's temperature drops 2°C below the temperature setting, then charge will restart automatically.
- The charger will completely stop charging if the battery's temperature reaches the temperature setting during the 4th step.
- While the cursor is indicating the temp check, if the  button is pressed, it indicates step 1.

Select or de-select "1" with the  &  buttons.


 : Temp check is de-selected in step 1.


 : Temp check is selected in step 1.


To confirm the selection for step 1 and to move the cursor to step 2, press the  button.


Select or de-select "2" with the  &  buttons.


 : Temp check is de-selected in step 2.

 : Temp check is selected in step 2.

To confirm the selection for step 2 and to move the cursor to step 3, press the  button.

Select or de-select "3" with the  &  buttons.

 : Temp check is de-selected in step 3.

 : Temp check is selected in step 3.

● About Four-Step charge mode

- Peak detection or temp cutoff are ONLY activated in step 4.
- It is strongly recommended to set 120% of pack's rated capacity in step 4.
- Parameters set in the Four-Step charge screen are completely different from those set in the Main memory screen.
- Four-Step charge mode can not be activated if the temperature sensor is NOT connected.
- The overall steps can be reduced if same amount of charge capacity is set in both step 2 and step 3.
- Following settings for the charge currents is recommended:
 - Step 1: low charge current to prepare the battery for the fast charge.
 - Step 2: high charge current to deliver much capacity and get much punch.
 - Step 3: reduce charge current again not to generate too much heat in the battery.
 - Step 4: again a low charge current to get much capacity into the battery.

Examples for Four-Step charge settings:

GP 3300				
Step	1	2	3	4
Capacity	1000mAh	2500mAh	3200mAh	4200mAh
Chg current	3.0A	6.5A	5.0A	4.0A

GP 3700				
Step	1	2	3	4
Capacity	1000mAh	2600mAh	3400mAh	4400mAh
Chg current	3.0A	7.0A	5.5A	4.0A

Sanyo 3600				
Step	1	2	3	4
Capacity	1000mAh	2400mAh	3400mAh	4400mAh
Chg current	3.0A	6.0A	5.0A	4.0A

● **Setting parameters for Four-Step charge**

Parameter	Setup Value
Battery cells	1 ~ 10 cell
Peak sensitive	3 ~ 15mV/cell, Zero Delta Peak
Temperature cut-off	10 ~ 55°C 1°C/step 50 ~ 132 °F 2 °F/step
Step1 capacity	100 ~ 5000mAh
Step2 capacity	100 ~ 5000mAh (Step2 >= Step1)
Step3 capacity	100 ~ 5000mAh (Step3 >= Step2)
Step4 capacity	100 ~ 5000mAh (Step4 >= Step3)
1~4Step Charge current	0.1 ~ 8.0A
Reserve time	Max 600min
Trickle charge current	0 ~ 500mA 50mA/step
Discharge → Charge	On/off
Re-flex charge	1 ~ 3step (on/off)
Impulse charge	1 ~ 3step (on/off)
Temperature check	1 ~ 3step (on/off)

Motor break-in setup

```
[ MOTOR Break-in ]
→ set volt : 0.0V
set time   : 00:00:00

TIME      : 00:00:00
VOLTAGE   : 0.00V
CURRENT   : 0.00A
```



```
[ MOTOR Break-in ]
set volt : 0.0V
→ set time : 00:00:00

TIME      : 00:00:00
VOLTAGE   : 0.00V
CURRENT   : 0.00A
```

● Set voltage

- Press the **ENTER** button to highlight the voltage.
- Set the desired voltage from 1.0 to 8.0V with the **◀** & **▶** buttons. Press the **ENTER** button to confirm the voltage setting.

● Set time

- Press the **ENTER** button to highlight the time.
- Set the desired break-in time from 1 second to 24h/59min/59sec with the **◀** & **▶** buttons.
- Press the **ENTER** button to confirm the time setting.

- Connect the motor's positive lead to the charger's red, positive (+) banana jack, connect the motor's negative lead to the charger's black, negative (-) banana jack. After setting the voltage and the break-in time, press and hold the **ENTER** button to start the motor break-in function.

```
[ MOTOR Break-in ]
set volt : 3.0V
set time : 01:10:30
< RUNNING ... >
TIME      : 00:00:10
VOLTAGE   : 0.00V
CURRENT   : 0.00A
```

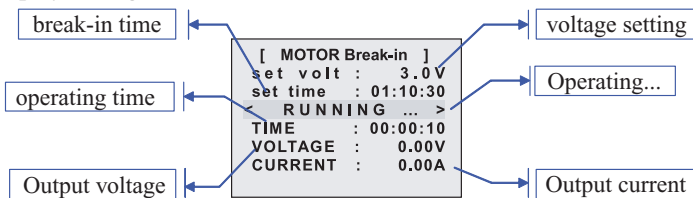
● Changing the voltage

- The voltage can be changed while the motor break-in is working.

● Changing the time

- The break-in time can be changed while the motor break-in is working.

● Display during motor break-in function



● Note

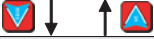
- The Motor break-in function is designed to deliver up to 10 amps continuously and up to 30 amps for a short time. Make sure to use a strong enough power source.
- If you use a very powerful motor and you get the error message "Motor Overcurrent", try to start the break-in function with 1.0V and increase the voltage slowly to the desired value when the motor is already running.

User setup

```
[ USER SETUP ]
→fan control   : on
temp. mode    : °F
button sound  : on
finish sound  : 10sec
melody        : 1
lcd contrast  : 10
< User Name... >
```



```
[ USER SETUP ]
fan control   : on
→temp. mode   : °F
button sound  : on
finish sound  : 10sec
melody        : 1
lcd contrast  : 10
< User Name... >
```



```
[ USER SETUP ]
fan control   : on
temp. mode    : °F
→button sound : on
finish sound  : 10sec
melody        : 1
lcd contrast  : 10
< User Name... >
```



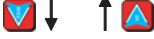
```
[ USER SETUP ]
fan control   : on
temp. mode    : °F
button sound  : on
→finish sound : 10sec
melody        : 1
lcd contrast  : 10
< User Name... >
```



```
[ USER SETUP ]
fan control   : on
temp. mode    : °F
button sound  : on
finish sound  : 10sec
→melody       : 1
lcd contrast  : 10
< User Name... >
```



```
[ USER SETUP ]
fan control   : on
temp. mode    : °F
button sound  : on
finish sound  : 10sec
melody        : 1
→lcd contrast : 10
< User Name... >
```



● Fan control

- Select “on” or “auto” with the & buttons.
- on: The fans will continually run.
- auto: The fans will turn on dependent on the internal temperature of the charger.

● Temperature mode

- The temperature scale can be selected between °C and °F with the & buttons.

● Button sound

- Select button sound “on” or “off” with the & buttons.
- Note: Even if “off” is set, the charger will sound if errors occur.

● Finish sound

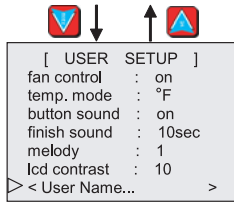
- Select “off” or “wanted time” for the finish sound with the & buttons to indicate a completed function.
- Possible values: off, 5, 10, 20, 30, 40, 50sec., 1, 2, 3min.

● Melody

- Select 5 different tunes to indicate that a function had been ended with the & buttons.
- This can be also turned off.
- If melody is highlighted, the melody is played.

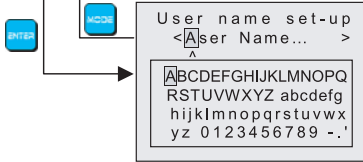
● LCD Contrast

- Adjust the contrast of the LCD screen from 1 to 15 with the & buttons to have the best view.
- 1 indicates low contrast, 15 indicates maximum contrast.



● **User name**

- The name which will appear on the opening screen can be changed to identify your charger.



- Move the symbol underneath the characters in the string of letters with the & buttons.

- Choose the desired letter with the & buttons, and press the button to confirm the selected letter.

Data view

This screen shows the various data on the input and output of the charger.

```
[ Data View ]
> input volt : 0.000V
  output    : 0.000V
  batt.temp : 0.0 °C
  peak temp : 0.0 °C
  bat res.  : 0m@
  chg time  : 0s
  dchg time : 0s
```

- **Input voltage**

- Shows the DC voltage at the input lead.

- **Output voltage**

- Shows the DC voltage at the output jacks.

- **Battery temperature**

- Shows the measured temperature of the battery. If no sensor is connected, “No.Sens” is shown.

- **Peak temperature**

- Shows the highest measured temperature of the battery.

- **Battery resistance**


- Shows the measured internal resistance of the battery, which is detected after 2 minutes of discharging.

- **Charge time**


- Shows the charged time.

- **Discharge time**

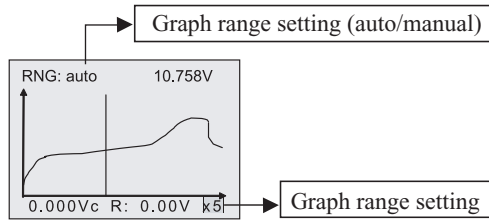
- Shows the discharged time.

- The following “graphic data” will appear if the  button is repeatedly pressed within the Data View screen.

```
[ Data View ]
output    : 0.000V
batt.temp : 0.0 °F
peak temp : 0.0 °F
bat res.  : 0m@
chg time  : 0s
dchg time : 0s
> graphic data view
```

- When the cursor is next to “graphic data view” and you press the  button, the Graphic View will be shown on the screen.

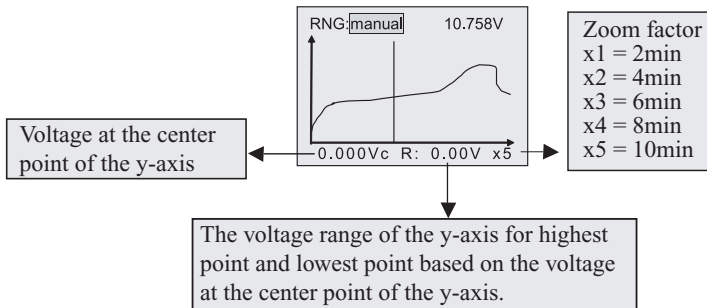
● **Graphic data view**



- Move the graph cursor to the desired value with the & buttons.
- Once the or button is pressed, the graph shape is changed while the graph range is changed as well.

● **Manual graph view**

- If the graph range is set to manual, the following graph will be shown:



- Move the graph cursor to the desired value with the & buttons.
- Once the or button is pressed, the graph shape is changed while the graph range is changed as well.

Cycle data display

[CYCLE DATA]		
NO	CAPACITY	VOLTAGE
> 1	C: 0mAh	0.000V
	D: 0mAh	0.000V
2	C: 0mAh	0.000V
	D: 0mAh	0.000V
3	C: 0mAh	0.000V
	D: 0mAh	0.000V



[CYCLE DATA]		
NO	CAPACITY	VOLTAGE
1	C: 0mAh	0.000V
	D: 0mAh	0.000V
> 2	C: 0mAh	0.000V
	D: 0mAh	0.000V
3	C: 0mAh	0.000V
	D: 0mAh	0.000V



[CYCLE DATA]		
NO	CAPACITY	VOLTAGE
8	C: 0mAh	0.000V
	D: 0mAh	0.000V
9	C: 0mAh	0.000V
	D: 0mAh	0.000V
> 10	C: 0mAh	0.000V
	D: 0mAh	0.000V

● Cycling

Once the cycling is activated, this screen shows the charged capacity, peak voltage, discharged capacity and discharge average voltage for each charge and discharge period up to 10 full cycles.


● Normal charge and discharge

If charge or discharge was activated, the capacity values will be shown at cycle #1.

● RE-PEAK operation

Cycle #1 shows the previous data.
 Cycle #2 shows data for Re-Peak #1.
 Cycle #3 shows data for Re-Peak #2.
 Cycle #4 shows data for Re-Peak #3.

Starting Charge, Discharge or Cycle

- To start a charge, discharge or cycle or to change the charge or discharge mode, while in the Main Memory screen or in the Four-Step charge screen, press and hold the  button for 2 seconds. Then the following screen will be shown for NiCd/NiMH batteries:





[NiCd/NiMH]

```
[0]Memory Name...
NiCd 00cell 0000mAh

> CHARGE < LINEAR >
  D-CHARGE < MANUAL >
  CYCLE
```

- Choose the desired mode (CHARGE / D-CHARGE / CYCLE) with the  &  buttons.



① Charge mode






- Move the cursor next to CHARGE. Press now the  button to highlight the charge mode. Then select the desired charge mode (Automatic, Linear, Reflex, Repeak) with the  &  buttons. Press again the  button to confirm the selected charge mode. (For more information about charge modes please refer at page 28).

```
[0]Memory Name...
NiCd 00cell 0000mAh

> CHARGE < LINEAR >
  D-CHARGE < MANUAL >
  CYCLE





reserv(000m) : off
```

expected chargetime →  reserv(000m) : off ←  reserve time setting

- Once LINEAR or RE-PEAK is selected, “reserv(000m) : off” will be shown at the bottom of the screen. The desired “reserve time” can be set with the  &  buttons.
- For example, if your next race starts 90 minutes from now, if “expect” time is 50 minutes which the charger calculated for full charge, set the “reserve time” to 80 minutes so that the charger first waits 30 minutes and then starts charge process. This will leave 10 minutes to go to the start line for the race.
- After selecting the RE-PEAK mode, if the  button is pressed, “re-peak cycle” will be shown at the bottom of the screen. Select the desired re-peak cycle #
- with the  &  buttons.

Once the  button is pressed and held for 2 seconds, the charger should start charging.


② Discharge mode

- Place the cursor next to “D-CHARGE”. Press the  button to highlight the discharge mode. Then, select the desired discharge mode (AUTOMATIC/MANUAL) with the  &  buttons.
- Press the  button again to confirm the selected discharge mode.

```
[0]Memory Name...  
NiCd 00cell 0000mAh  
  
> CHARGE < LINEAR >  
D-CHARGE < MANUAL >  
CYCLE
```


- Discharge will start if the  button is pressed and held for 2 seconds.


③ Cycle mode (NiCd / NiMH only)

- Place the cursor next to CYCLE, then press and hold the  button for 2 seconds to start cycle.


[Li-Ion/Li-Po]

```
[0]Memory Name...  
LiPo 7.4V 2500mAh  
  
> CHARGE CC-CV  
D-CHARGE MANUAL
```

- When Li-Ion or Li-Po is selected, select CHARGE or D-CHARGE, then press and hold the  button for 2 seconds to start charge or discharge.

Note: If you press the  button at any time, the charger will go back to the Main screen.

Reserve time delay screen

- If the “reserve time” is set, and if the operation is started by pressing and holding the  button for 2 seconds, the [RESERVE] DELAY screen will be shown. When the START time expires, the charger will automatically start the charge process.


```
[RESERVE] DELAY  
  
START : 19m59s  
RESERVE : 60min  
EXPECT : 40min  
  
BAT.VOLT : 00.000V  
BAT.TEMP : 000.0 °F
```

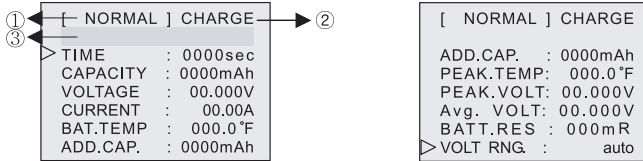
(D) C --> D cycle screen

- If a (D) C --> D cycle is selected, the right cycle screen will be shown.
This mode is to discharge first a remaining amount of capacity out of the battery and then starts Charge to Discharge.

```
[PRE-STEP] DISCHARGE  
STEP<1> > IMP FLX  
> TIME : 0000sec  
CAPACITY : 0000mAh  
VOLTAGE : 00.000V  
CURRENT : 00.00A  
BAT.TEMP : 000.0 °F  
ADD.CAP. : 0000mAh
```


Charge & Discharge status screen

- If the  button is pressed at any time while a function is being activated, the function will immediately stop and the charger will revert to the main screen.



- ① Charge / Discharge mode displays

Charge mode	Discharge mode
AUTOMATIC	AUTOMATIC
LINEAR	LINEAR
RE-FLEX	PRE-STEP
RE-PEAK	CYCLE
STEP	
TOP-OFF	
CYCLE	
CC-CV	

- ② Operating mode display



CHARGE / DISCHARGE

- ③ Optional operating screens

```
[ CYCLE ] CHARGE
CHG>DCH : 1/2
> TIME : 0000sec
CAPACITY : 0000mAh
VOLTAGE : 00.000V
CURRENT : 00.00A
BAT.TEMP : 000.0 °F
ADD.CAP. : 0000mAh
```

```
[ CYCLE ] CHARGE
CHG>DCH : 1/2
> TIME : 0000sec
CAPACITY : 0000mAh
VOLTAGE : 00.000V
CURRENT : 00.00A
BAT.TEMP : 000.0 °F
ADD.CAP. : 0000mAh
```

```
[ RE-PEAK ] CHARGE
CYCLE : 1/5
> TIME : 0000sec
CAPACITY : 0000mAh
VOLTAGE : 00.000V
CURRENT : 00.00A
BAT.TEMP : 000.0 °F
ADD.CAP. : 0000mAh
```

- ④ TIME: Elapsed time.
- ⑤ CAPACITY: Charged capacity during charge or discharged capacity during discharge
- ⑥ VOLTAGE: Measured voltage at the output banana jacks (battery).
- ⑦ CURRENT: Current being delivered from/to the battery.
 - Current can be changed during charge or discharge. Place the cursor next to CURRENT and set the desired current with the  &  buttons.
- ⑧ BAT.TEMP: Shows the battery temperature.
- ⑨ ADD.CAP.: Additional capacity during “top-off” or “re-peak” charge.
- ⑩ PEAK.TEMP: Shows the maximum measured temperature of the battery.
- ⑪ PEAK.VOLT: Shows the maximum voltage of the battery during charge.
- ⑫ Avg.VOLT: Shows the average voltage of the battery during discharge.
- ⑬ BATT.res: Shows the internal measured resistance of the battery.
- ⑭ VOLT.RNG: Select the voltage range (auto or manual) for graphic view.

Cycle delay screen during cycle

```
[ CYCLE ] DELAY
END: DELTA-PEAK
START : 000m00s
CHG>DCH : 00/00

BAT.VOLT : 00.000V
BAT.TEMP : 000.0 °F
```

- When the START time expires, the charger will automatically start the next process.

Charge or Discharge completion screen


```
[ NORMAL ] CHARGE
END: DELTA-PEAK → ①
> TIME : 0000sec → ①
CAPACITY : 0000mAh
VOLTAGE : 00.000V
CURRENT : 00.00A → ②
BAT.TEMP : 000.0 °F
ADD.CAP. : 0000mAh
```

- ① Charge or Discharge completion displays


Charge	Discharge
DELTA-PEAK ZERO DELTA-PEAK CC-CV FULL TEMPERATURE TOP-OFF TIME MAX CAPACITY FLAT LIMITED TIME LIMITED	CUT-VOLTAGE

- ② Trickle charge current



- NiCd / NiMH: The charger charges the battery with the selected trickle current.
- Li-Ion / Li-Po: The charger charges the battery with CV (Constant Voltage).

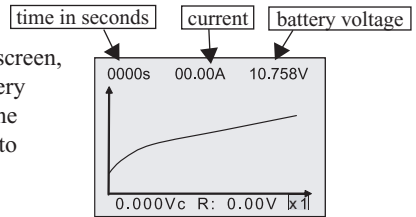
- TIME: Elapsed time.
- CAPACITY: charged or discharged capacity.
- VOLTAGE: Shows the voltage of the battery.
- BAT.TEMP: Shows the temperature of the battery.
- ADD.CAP.: Shows the additional charged capacity during re-peak.
- Press the  button to revert to the Main Memory screen.

Charge & Discharge status graphs



- If you have chosen the desired setting for “VOLT RNG” on the above screen (auto/manual), you can change between the Graph View and the Status screen at any time by pressing the  button.

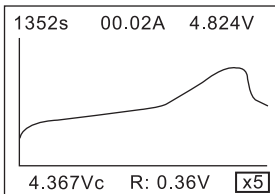
① Automatic View



If the “auto” view is selected on the Status screen, the charger will automatically set nearly every graph parameter. Only the Zoom factor in the lower-right corner can be adjusted from x1 to x5 by pressing the  &  buttons.

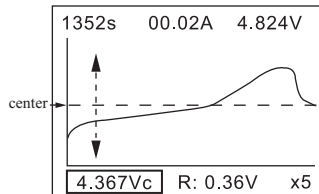


② Manual view

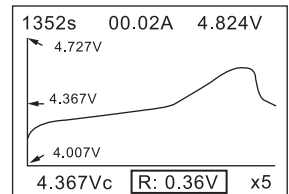
When the “manual” view is selected on the status screen, all parameters can be adjusted. The first adjustable parameter will be highlighted. You can change between the different parameters by pressing the  &  buttons.



Adjust the Zoom factor in the lower-right corner from x1 to x5 with the  &  buttons.



Adjust the voltage at the center point of the y-axis.



Set the voltage range of the y-axis. For example:
Center = 4.367V,
R = 0.36V
=> highest Point = 4.727V,
=> lowest Point = 4.007V

Charge modes

A) AUTOMATIC CHARGE mode

- The automatic charge mode is only designed for NiCd & NiMH batteries.
- The charger automatically calculates all proper charge parameters to properly charge the battery.
- The fast charge will end if the maximum battery temperature is reached or if peak charge is achieved.
- Peak sensitivity is preset at 5mV/cell for NiCd and 4mV/cell for NiMH.

B) AUTOMATIC DISCHARGE mode

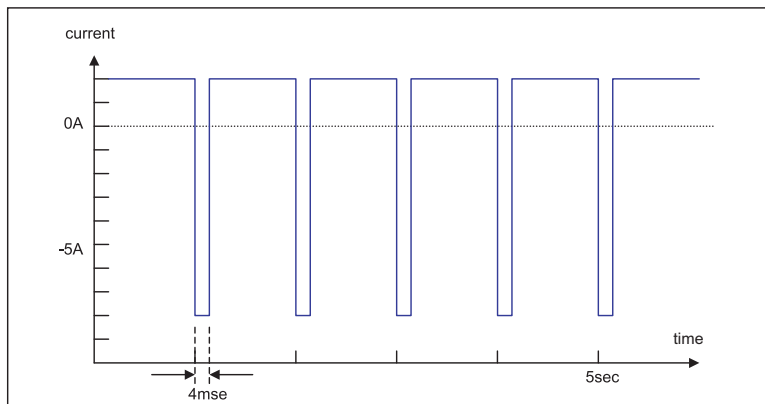
- The automatic discharge mode is only designed for NiCd / NiMH batteries.
- The charger automatically calculates all proper discharge parameters to properly discharge the battery.
- The discharge cutoff voltage is preset to 0.8V/cell.

C) Linear charge & manual discharge mode

- Linear current is delivered to the battery in Linear charge mode.
- This mode is activated based on user selected parameters.

D) Re-Flex charge mode

- The Re-Flex charge mode charges for 99.6% of every second and deeply discharges for 4 milli-seconds to make charging more efficiently. This charge mode could be very helpful on older NiCd batteries.

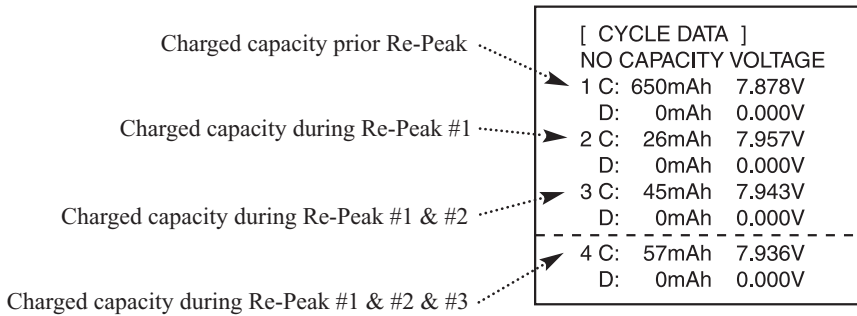


< RE-FLEX CHARGE >

- The quick discharge current is equal to the charge current multiplied by 4. for example: charge current = 2A => discharge pulse = 8A
- Reflex charge is activated up to 80% of the full charge process for exact peak detection.

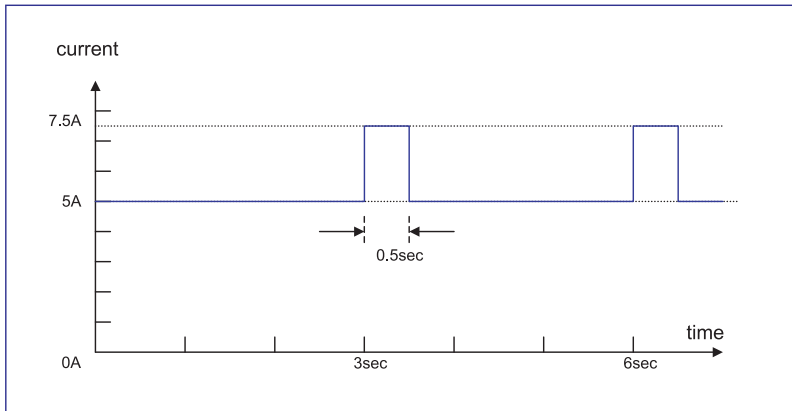
E) Re-Peak charge mode

- The Re-Peak charge mode is to charge the battery once, twice or three times in a row automatically and it is good to know how well your battery receives fast charges. It is also good to make sure that the battery is really 100% full.
- A five minute cool-off delay occurs after each re-peak charge
- It is also useful to increase the temperature and the punch of NiMH batteries.
- Each Re-Peak data is automatically stored at cycle #2 - cycle #4 and the capacity value which was charged before starting Re-Peak is stored at cycle #1.



F) Impulse charge mode

- Impulse charge mode is the opposite of the reflex charge mode.
- It is only available in Four-Step charge mode.
- It generates every 3 seconds a current pulse with 1.5x the charge current setting and 0.5 seconds length.



-
- Impulse charge helps to clear the cell's internal plates from build-up of oxidizing gas bubbles.
 - Impulse charge is not available in step 4 because of accurate peak detection.

G) Top-Off charge

- Top-Off charge is designed for NiMH batteries to fully charge the battery pack and get it to the right temperature for maximum punch when driving.
- If this charge mode is set, top-off charge will automatically start 5 minutes after fast charge has finished.
- Top-Off charge is activated for 20 minutes, but if peak is detected or the temperature reaches the maximum setting, top-off charge will automatically end.

H) CC/CV charge mode

- CC (Constant Current) / CV (Constant Voltage) charge mode is for Li-Ion & Li-Po batteries only.
- When the battery reaches 4.2V/cell for Li-Po and 4.1V/cell for Li-Ion, constant current stops and the charger starts delivering constant voltage to the battery.
- When the charge current drops to approx. 100mA during constant voltage, the charger beeps to indicate that fast charge has finished. The charger will automatically start "Li-Po trickle charge" indicated by "Trk" on the screen to fully charge the battery.
- When the trickle charge current drops below 30mA, the charger will completely stop the charging. "Trk" changes to "0.00A".

I) Battery resistance measurement

- The charger will measure the internal resistance of the battery 2 minutes after discharge has started.
- If the battery voltage is lower than 1.0V/cell for NiCd/NiMH or 3.0V/cell for Li-Ion/Li-Po batteries, the charger will not measure the resistance, because it is not valuable to measure the resistance when the voltage is too low.

Error Messages

[Input voltage]

* The present input voltage is 0.00V.
* Pls check the input voltage.
* The input voltage must be 11-15V.

[No battery]

* A battery is not connected to the output
* Please connect the battery to the output then restart !

[Reverse polarity]

* A battery is connected to the output in reverse !
* Pls correctly connect the battery to the output.

[Open circuit]

* A battery is disconnected during an operation.
* Pls reconnect the battery and restart!

[Low output voltage]

* Output voltage is lower than the selected cells or voltages
* Pls select proper cells or voltages

[High output voltage]

* Output voltage is higher than the selected cells or voltages
* Pls select proper cells or voltages

[No motor]

* A motor is not connected to the output.
* Please connect the motor to the output.

[Motor disconnection]

* A motor has become disconnected during an operation.
* Pls reconnect the motor and restart!

[Temperature sensor]

* A temperature sensor is connected in reverse or is defective.

[Bat. Temp too low]

* Battery temp is too low to be operated!

BAT.VOLT: 00.000V

[Bat. Temp too high]

* Battery temp is too high to be operated!

BAT.VOLT 00.000V

[Charger too hot!]

* Charger is too hot!
Pls wait until the charger cools !

[Data communication]

* Something is wrong with the internal circuit.
* Contact Hobby Services

[Motor Overcurrent]

* Pls check the motor as overcurrent has flowed into the motor!!

[Short-circuited]

* Output short-circuited.
* Pls check the output.!

[Sensor Connection]

* A temp sensor must be used in 4 step mode.

* Connect LM-35 temp sensor.

[Internal Sensor]

* Internal temp is too hot !

* Contact Hobby Services if this message appears often.



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