



# Product Information Sheet for Turtle CH-TSB-xxx Charger

The Turtle charger is available as an external or internal battery charger suitable for all rechargeable battery chemistries. It is custom programmed by our engineers to suit your design requirements with charging power up to 100 watts available.

PCB's manufactured in 50 watt and 100 watt output versions. 50W version also available as stand-alone charger.

Pre-programming includes functions setting charging current and charging voltage, constant current, constant voltage, pre-conditioning, float charging, charge termination methods and setting. Input and output cabling and connector options for all international markets are available upon request.

Specifications			
<b>Input Voltage</b>	10-75V DC	<b>Output Voltage</b>	0.8V-50V For battery packs up to -12 cells in series (Li-Ion) -14 cells in series (Li-FePO4) -30 cells in series (Ni-MH and Ni-Cd) -20 cells in series (Lead-Acid)
<b>Output Current:</b>	5A maximum Limited by internal temperature rise and input power supply rating. Output current will decrease with PCB temperatures above 75°C (adjustable)		

	CH-TSB-002	CH-TSB-002PCB	CH-TSB-003PCBR5
<b>Image</b>			
<b>Description</b>	External Turtle Charger up to 50W	Internal Turtle Charger up to 50W	Internal Turtle Charger up to 100W
<b>Dimensions</b>	Length 112mm Width 66mm Height 40mm Weight 140g	91mm 46mm 26.3mm 10g	80mm 61mm 14.5mm 17g

<b>Voltage accuracy</b>	< 1%	<b>Voltage limit</b>	4.20V per cell +/- 1%.
<b>Current accuracy</b>	< 5%	<b>Tolerance on timing</b>	+/- 5%
<b>Temp accuracy (internal)</b>	< 1%, resolution 0.01°C. PCB mounted thermistor self protects charger		
<b>Temp accuracy (external)</b>	< 1°C. Thermistor can be battery mounted. Detects rate of temp rise for NiCd/NiMH. Allows temp compensated voltage for other chemistries Current throttles back at 75°C. Lower charging limit 0°C, Upper limit adjustable.		

### Accessories

	<a href="#">FRA-024-S24-I Mini AC/DC Adapter</a>	24W (24V 1A) Matchbox size wall plug adapter. Adapter plates available for EU, UK, USA and Australia
	<a href="#">TA-124UN AC/DC Adapter</a>	50W (12V 4.2A) power adaptor using IEC320 Cable (available separately)
	<a href="#">PA-1 DC Adapter</a>	Car cigarette lighter adapter

LED patterns (routine)		LED patterns (exceptions)	
<b>Traffic light (red-orange-green):</b>	System reset. Occurs at power on and battery connection	<b>Three Red Flashes:</b>	Charge suspended. Battery volts too low.
<b>Slow orange blink:</b>	System waiting. Battery Disconnected	<b>Two Red Flashes:</b>	Charge suspended. Battery volts too high.
<b>Solid Orange:</b>	Constant current phase. (inc. pre-condition if programmed)	<b>Slow red blinking: (1 flash every 5 sec)</b>	Charge suspended. Battery too hot. Or PCB too hot (PCB Self protected to 75°C)
<b>Orange with Green blink:</b>	Constant voltage phase	<b>Fast red blinking:</b>	Thermistor Error. (Needs Power Reset)
<b>Solid Green:</b>	Charge Complete. Float Charge continues (if programmed)	<b>Orange blinking: (1 flash every 1/2 sec)</b>	Timeout. Time limit is customizable on request
		<b>Solid red:</b>	Fault. (Needs Power Reset)

### Other Information

Input power supply should be of sufficient power for job. Power consumption can be calculated by the following equation: Input power required = ((max battery volts) x (charge current)) / 0.85.	For Li-Ion batteries, maximum volts = 4.2V per cell. For Ni-XX batteries, maximum volts = 1.85V per cell. For Lead-Acid batteries, maximum volts = 2.45V per cell.
<b>The Turtle charger is highly customizable. Other customizations available upon request include adjustable preconditioning mode for deeply discharged batteries and adjustable overheating threshold. Comprehensive technical support is available to clients of this product including design advice for building into your products and matching charger and battery parameters to your product requirements.</b>	