

# ONYX<sup>150</sup><sup>TM</sup>

## AC/DC LIPO CHARGER

### INSTRUCTION MANUAL



The Onyx 150 AC/DC LiPo balancing charger is the perfect entry-level LiPo charger for modelers using up to 3S LiPo batteries. Inexpensive and very easy to operate, the Onyx 150 utilizes the CC/CV charge method, with voltages customized for LiPo batteries. Capable of operating from 110V AC or 12V DC input sources, this tiny, lightweight charger is perfect for use at home or in the field. Selectable charge currents range from 1.5A to 5A and a built-in balancing function ensures all cells are charged to optimum voltage every time.



It is strongly recommended to read this manual completely before use! Damage resulting from misuse or modification will void your warranty.



**WARNING!!** Charging lithium-based rechargeable batteries poses a risk of FIRE! NEVER treat lithium-based batteries in the same manner as other battery types. NEVER leave lithium batteries unattended while being charged! ALWAYS charge lithium-based batteries in a fireproof location! Failure to follow all care and handling instructions contained in this manual could result in quick, severe, permanent damage to the batteries and all surroundings!! Follow all safety precautions when using such batteries, as listed on page 3 of this manual!

## SPECIFICATIONS

AC Input:	110V AC 60Hz, U.S. plug	Output Connections:	Attached lead with Deans® Ultra Plug® male connector & radio charge jack
DC Input:	11-15V DC, detachable lead with alligator clips	Balancing Connector:	ElectriFly® style 3S (2S adapter included)
Output Power:	AC: 50W DC: 50W	Balancing Accuracy:	5mV per cell
Battery Types:	1-3S LiPo	Max. Node Current:	200mA
Battery Capacity Range:	100 ~ 7500mAh	Protective Devices:	Solid-state reverse polarity & current overload
Fast Charge Start:	Auto start at hook up	Dimensions:	4.1 x 3.5 x 1.1 in. (104 x 90 x 29mm)
Fast Charge Current:	1.5A, 3.5A, 5.0A*	Weight:	16.6 oz (470 g)
Fast Charge Termination:	CC/CV (Based on nominal voltage of 3.7V/cell)		
Fast Charge Safety Timer:	90 Minutes		
Controls:	Auto-start, switchable current selector		
Display Type:	3-color LED		

\*Note: Maximum charge current for a 3S pack will be ~4.6A.

## SPECIAL FEATURES

- Built-in balancing for 1-3S LiPo.
- 1.5A, 3A, 5A selectable charge rates.
- Includes built-in radio battery jack for receiver or transmitter batteries.
- Deans® male Ultra Plug® installed on output.
- Includes Deans® female to Traxxas® male adapter.
- Detachable DC input cord.
- Built in balancing connector for 3S with 2S adapter included.

## IMPORTANT PRECAUTIONS



- Do not leave the charger unattended while in use.
- **Disconnect the battery and remove input power from the charger immediately if the charger or battery becomes hot!!**
- **Disconnect the battery if it begins to swell while being charged!**
- Do not attempt to charge any battery types other than LiPo as permanent damage to the battery and charger could result.
- Do not use automotive type battery chargers to power the charger.
- Do not allow water, moisture or foreign objects into the charger.
- Do not block the fan or air intake holes, which could cause the charger to overheat.
- Do not attempt to use batteries with more cells or total voltage than listed in the specifications.
- Do not place the charger or battery on flammable surfaces or near combustible materials while in use, such as carpet, cluttered workbench, paper, plastic, vinyl, leather, and wood, inside an R/C model or full sized automobile.
- Do not overcharge batteries as permanent damage could result. Do not use a charge current that exceeds the safe level of the battery.
- Do not connect the charger to AC and DC inputs at the same time.
- Allow the charger and battery to cool down between charges.
- Always disconnect from power source when not in use.

## GLOSSARY OF TERMS

**Amps (A):** The unit of measure for charge current.

**Milli-amps (mA):** A unit of measure for current, being amps (A) multiplied by 1000 and listed as “mA”. So 2.5A is the same as 2500mA ( $2.5 \times 1000$ ). Or, to convert mA to amps, divide the mA number by 1000. So 25mA is the same as 0.025A (25 divided by 1000).

**Capacity and milli-amp hours (mAh):** The amount of energy a battery can store is called its **capacity**, which is defined as how much current a battery can supply constantly over one hour of time. Most hobby batteries are rated for capacity in “mAh” or **milli-amp hours**. A 650mAh battery can deliver 650mA of current for one hour ( $650\text{mA} \times 1\text{hr} = 650\text{mAh}$ ). A 3200mAh battery can deliver 3200mA (3.2A) of current for one hour ( $3200\text{mA} \times 1\text{hr} = 3200\text{mAh}$ ), etc.

**“C” rating:** Capacity is also referred to as the “C” rating. Some battery suppliers recommend charge currents based on the battery’s “C” rating. A battery’s “1C” current is the same number as the battery’s rated capacity number, but noted in mA or amps. A 600mAh battery has a 1C current value of 600mA, and a 3C current value of ( $3 \times 600\text{mA}$ ) 1800mA or 1.8A. The 1C current value for a 3200mAh battery would be 3200mA (3.2A), etc.

## INPUT POWER

**AC Input:** For indoor use, this charger includes a built-in switching AC power supply that delivers power by connecting the AC power cord to a common U.S. 110V AC outlet.

**DC Input:** This charger can be powered by a portable 12V DC power source for use at the track. On the left side of the charger, connect the DC power cord’s alligator clips directly to the output terminals on the 12V DC power source. Always match polarities (red lead to red “+” terminal, black lead to black “-” terminal). To utilize the charger’s **absolute maximum** power capabilities the DC power source must be capable of delivering at least 7 amps while maintaining 12 volts DC.



**WARNING! Never accidentally short together the positive (+) and negative (-) input connections when connected to 12V DC power. Failure to do so could result in permanent damage to the power source and the charger.**

The charger will be on at all times when connected to input power. Disconnect the charger from input power when not in use.

## CONTROLS AND CONNECTIONS



**WARNING!** Do not attempt to charge one battery through the main output lead and another through the jack on the front edge of the charger at the same time! Doing so might permanently damage the charger.

## CARE AND HANDLING OF LiPo BATTERIES



**WARNING!! DO NOT** try to charge lithium-polymer (LiPo) cells in the same way as other battery types! Always read the instructions that are included with your lithium batteries carefully before use. Failure to follow these care and handling instructions can quickly result in severe, permanent damage to the batteries and their surroundings and even start a FIRE!

- **ALWAYS** charge lithium batteries in a fireproof location, which could be a container made of metal or ceramic tile. Monitor the area with a smoke or fire alarm, and have a lithium approved fire extinguisher available at all times.
- **ALWAYS** use a LiPo charge bag when charging LiPo batteries, such as the Great Planes® SafeCharge™ LiPo Battery Charge Bag (GPMP0751).
- **NEVER** attempt to extinguish a lithium fire with water or a non-lithium approved fire extinguisher! Use **ONLY** a “Class D” fire extinguisher.
- **ALWAYS** provide adequate ventilation around LiPo batteries during charge, while in use, and during storage.
- **NEVER** allow LiPo cells to overheat at any time, as they can and usually will become physically damaged and could possibly **EXPLODE** or catch **FIRE!!** If a battery becomes overheated (over 140°F, 60°C), disconnect it from the charger **IMMEDIATELY!**
- **NEVER** continue to charge LiPo batteries if the charger fails to recognize full charge. LiPo cells which swell or emit smoke may be in an overcharge condition and should be disconnected from the charger immediately.
- **NEVER** charge LiPo batteries at currents greater than the maximum rated current as specified by the battery’s manufacturer.
- **NEVER** allow LiPo cells to come in contact with moisture or water at any time.
- **NEVER** allow the internal electrolyte from LiPo batteries to get in the eyes or on skin – wash affected areas immediately if they come in contact with the electrolyte and contact your physician!
- **ALWAYS** keep lithium batteries away from children.

## DETERMINING BATTERY SPECIFICATIONS

Always read your battery’s label and/or instruction sheet before use. Check to determine how many cells it contains or its nominal rated voltage. The chart at right is a quick reference for determining this information.

LiPo Voltage Chart	
Number of Cells	Nominal Voltage
1S	3.7 V
2S	7.4 V
3S	11.1 V

## STARTING CHARGE

1. Connect the charger to either AC or DC input power.
2. The charger will beep and the orange LED will flash once. The green LED will flash very slowly (once every four seconds) as a reminder that power is applied to the charger, and it's now ready for use.
3. Select a charge current with the current selection switch. Refer to the chart at right for recommendations. Do not exceed the maximum rated charge current for the battery.
4. START CHARGE – Connect the battery to the charger:

Charge Current Recommendations	
Battery's Rated Capacity	Charge Current Setting
750 – 1500mAh	1.5 A
1500 – 3500mAh	3.5 A
3500 – 7500mAh	5.0 A



- A. For a 3S battery that includes a balancing lead similar to as shown at right, connect it directly to the balancing jack on the side of the charger. If using a 2S LiPo pack, connect the battery's balancing lead to the supplied 2S adapter, and the adapter to the charger's balancing jack. **IMPORTANT! ALWAYS connect the battery's balancing lead to the balancing jack on the charger!** Note: For LiPo batteries that have a FlightPower® / ThunderPower balance connector, an optional adapter will be needed and is available separately (Onyx 150 ThunderPower Balance Adapter, DTXP4160).
- B. Connect the battery's main lead to the charger's output lead. For batteries having a Deans® Ultra Plug®, connect it directly to the Deans connector on the charger. For batteries with a Traxxas connector, the included Deans to Traxxas adapter will need to be connected to the charger first. Then connect the battery to the adapter. For batteries that ONLY have a universal Rx connector, connect it directly to the radio jack on the front edge of the charger. Make sure the battery's black wire is on the right when inserting the radio connector into the radio jack. **NOTE: Both the balance lead and the main charge lead MUST be connected in order to charge!**

Once the battery is connected, the charger will beep and automatically detect the number of cells in the pack, and the green LED will flash once for each cell in the pack. Fast charge will start automatically. The CC/CV charge method will fully charge the battery.

5. When the battery has become fully charged, the red LED will flash quickly, with tones for 10 seconds to indicate that fast charge has ended. Low level balancing currents may be applied after fast charge ends, if needed, until the battery is disconnected. The battery is now ready for use and can be disconnected from the charger.

To manually stop charge at any time, disconnect the battery from the charger. The orange LED will flash for 3 seconds and then return to ready mode.

A backup safety timer is built-in to automatically stop charge if the battery does not become fully charged in 90 minutes. If the LED begins flashing quickly (once per second), the safety timer has stopped charge. The battery might NOT be fully charged at this time. You could attempt to measure the voltage of the battery to determine if charge was actually received. Refer to the Troubleshooting Guide for more details.

## LED ACTIVITY

LED Activity		
LED Color	Indication	Definition
GREEN	Flashes 1 time (no battery connected)	Charger is in "Ready" mode and ready to charge.
	Flashes 1 time (battery connected)	1S LiPo is connected and charging.
	Flashes 2 times	2S LiPo is connected and charging.
	Flashes 3 times	3S LiPo is connected and charging.
RED	Flashes repeatedly (with audible tones for 10 seconds)	Battery has just finished charge and is ready for use.
	Flashes 1 time	1S LiPo is finished charging and can be disconnected for use.
	Flashes 2 times	2S LiPo is finished charging and can be disconnected for use.
	Flashes 3 times	3S LiPo is finished charging and can be disconnected for use.
ORANGE	See Error Code Chart	

Once the Onyx 150 has finished charging, the red LED will flash repeatedly in conjunction with audible tones. After the flashes and tones stop, the red LED will continue to flash once for each cell connected. (All errors are displayed by an orange LED. See the error code reference chart in this manual.)

## HEAT VENTILATION

Vents are built into the case to allow hot air to escape to help keep the electronic circuitry cool. This helps to maintain accurate operation and maximize the lifespan of the charge itself.

A built-in cooling fan helps to keep the charger cool during operation. This will help extend the service life of the charger and allow it to function more accurately and efficiently. **CAUTION: Do not block the vent holes or cooling fan during operation, as it could cause the charger to overheat and possibly cause permanent damage.**

## ERROR MESSAGES AND TROUBLESHOOTING GUIDE

Errors are displayed by an orange LED. Several safety features are included in this charger to protect itself and the battery against certain unwanted conditions, as follows:

<b>Error Code Chart</b>	
<b>Orange LED Action</b>	<b>Problem and Solution</b>
Flashes once per 3 seconds	90-minute safety timeout occurred. Charge current setting is too low for battery. Battery might have internal problem and require replacement.
Flashes twice per 3 seconds	The battery is connected backwards. Reverse connections.
Flashes three times per 3 seconds	The voltage on the input is out of the 11–15V range. Check the voltage on the input and adjust as necessary.
Flashes four times per 3 seconds	The voltage of the pack or any cell is unacceptable. Ensure the battery pack is not out of balance before calling Product Support.
Battery connected but no LED	Charger not properly connected to input power or to battery. Re-check all connections and wiring. OR internal problem exists in charger or battery — contact Hobby Services.
Battery voltage low after charge is completed	Make sure charge current selection isn't too low for battery. Battery may be defective or out of balance and require replacement. Make sure the charger's backup safety timer hasn't expired before full charge ended.

## 5-YEAR LIMITED WARRANTY - \*U.S.A. and CANADA ONLY

Duratrax warrants this product to be free from defects in materials and workmanship for a period of five (5) years from the date of purchase. During that period, Duratrax will, at its option, repair or replace without service charge any product deemed defective due to those causes. You will be required to provide proof of purchase (invoice or receipt). This warranty does not cover damage caused by abuse, misuse, alteration or accident. If there is damage stemming from these causes within the stated warranty period, Duratrax will, at its option, repair or replace it for a service charge not greater than 50% of its then current retail list price. Be sure to include your daytime telephone number in case we need to contact you about your repair. This warranty gives you specific rights. You may also have other rights, which vary from state to state.

For service on your Duratrax product, warranty or non-warranty, send it post-paid and insured to:

**HOBBY SERVICES**  
3002 N. Apollo Drive Suite 1  
Champaign, IL 61822

(217) 398-0007

hobbyservices@hobbico.com  
duratrax.com

\*For warranty and service information if purchased outside the USA or Canada, see the additional warranty information insert (if applicable) or ask your retailer for more information.



