



DURATRAX® **ONYX™ 230**

The DuraTrax® Onyx™ 230 charger is great for a wide variety of applications! With charge currents up to 7 amps and wide output voltage range makes it equally useful for 1/32 scale micros as for large 1/8 scale electrics, plus nitro receiver packs and transmitter packs. The ability to also handle LiPo and LiFe cells is great for upgrading to the latest in battery technologies. AC/DC flexibility, plus the advanced reversed LCD with backlight, and simple menus and controls make it super-easy to use anytime. A quick reference flowchart is included for easy understanding of all menus.



It is strongly recommended to completely read this manual 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 9 of this manual!

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SPECIFICATIONS

AC input:	110V AC 60Hz
DC input:	11-15V DC, built-in lead with alligator clips
Battery types:	1 to 8 NiCd or NiMH (1.2 to 9.6V), 1 to 3 LiPo, Li-Ion, or LiFe (3.7 to 11.1V)
Battery capacity range:	50 to 9900mAh
Fast charge current:	0.1 to 7.0A linear, adjustable (50W maximum, 2C limit for lithiums)
Fast charge termination:	peak detection for NiCd/ MH, cc/cv for lithiums
Fast charge safety timer:	off - 300 minutes
Peak sensitivity:	3-20mV adjustable
Trickle charge current:	auto (1/20 fast charge setting), or manual adjust (0 to 250mA)
Controls:	4 push buttons
Battery memories:	10
Display type:	2 x 8 reversed LCD with backlight
Setup tones:	on / off
Audible melodies:	5
Output connections:	banana jacks (includes standard adapter)
Protective devices:	solid-state reverse polarity and current overload
Case size:	6.0" x 5.28" x 1.69" [153 x 134 x 43mm]
Weight:	23.5 oz. [666g]

* Charge lead – Banana plugs to Deans® Ultra® male available separately (GPMM3148)

* Adapter – Standard to Vendetta, MiniQuake, RS4 Battery available separately (DTXC2210)

SPECIAL FEATURES

- A tiny built-in switching AC power supply is great for portability and cramped pit areas, yet can still deliver up to 7 amps charge current!
- Fully adjustable charge currents and multi-chemistry adaptability for a wide range of applications.
- A custom cc/cv charge algorithm carefully charges lithium-polymer, lithium-ion, or lithium ferrite-phosphate (A123) batteries fully and safely!
- A peak detection system with automatic trickle charge fills NiCd and NiMH packs completely, for optimum battery voltage and run-time. 3-20mV adjustable peak detection helps to customize charger-to-battery performance.
- A custom reversed LCD with backlight – previously only available in expensive racing chargers – is great for easy viewing in any condition. Shows input and output voltages, peak voltage, charge current, charge capacity and time, and more!
- Push button controls and audible tones make for easy setup and control.
- A built-in fan helps to keep all electronics cool, for long-lasting performance.
- Built-in banana jacks allow for connection with many commonly found charge adapters. An adapter with standard plug is included.
- A DC power lead with alligator clips easily connects to many 12V DC power sources.
- Solid-state reverse polarity and current overload safety devices ensure trouble-free operation and long duration.

IMPORTANT PRECAUTIONS



Disconnect the battery and remove input power from the charger immediately if the charger or battery become hot!!

- Do not attempt to charge incompatible types of rechargeable batteries 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 overcharge batteries as permanent damage could result. Do not use a charge current rate which exceeds the safe level of the battery.
- Do not leave the charger unattended while in use.
- Do not place the charger or battery on flammable surfaces or near combustible materials while in use, such as a carpet, cluttered workbench, paper, plastic, vinyl, leather, and wood, inside an R/C model or full sized automobile!
- Do not connect the charger to AC and DC inputs at the same time.
- Allow the charger or battery to cool down between charges.
- Always disconnect the charger from the 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 x 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 x 600mA) 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 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 7.5 amps while maintaining 12 volts DC.

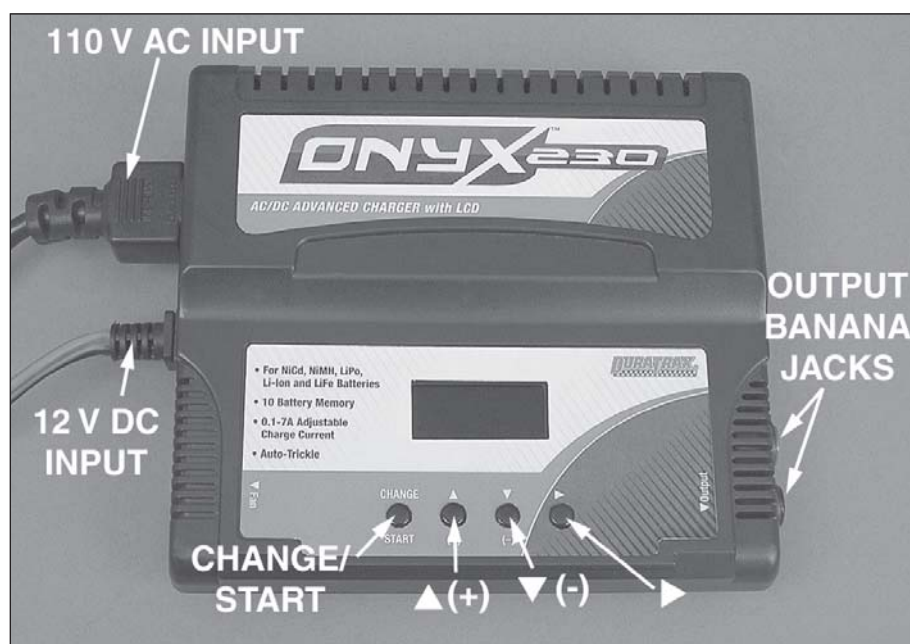


WARNING! Never accidentally short together the positive (+) and negative (-) input connections when connected to 12V DC power. Failure to do so could result in permanent damage to the power source and the charger.

The charger is rated for a maximum output power of 50 watts. Depending on certain conditions (if charge current is set to maximum, the maximum number of cells are connected to the output, and input voltage is low), the actual current delivered to the battery might be slightly less than the setting. This is normal.

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

CONTROLS & CONNECTIONS



CHANGE / START: For starting a charge, or to change settings.

▲ (+): For moving up through menus, or increasing the values of settings on-screen.

▼ (-): For moving down through menus, or decreasing the values of settings on-screen.

► : For moving to the right in the menus.

OUTPUT BANANA JACKS: For connection of any of a wide variety of battery charge leads/adapters. An adapter with standard connector is included. For transmitter, receiver, and small electric vehicle batteries, find a charge lead that best matches the type of radio that you are charging. Look for these and other charge adapters at your local retailer:

Item Number	Charge Lead Description
DTXC2210	Adapter – Standard to Vendetta, MiniQuake, RS4 Battery
GPMM3105	Charge lead – banana plugs to BEC connector
GPMM3148	Charge lead – banana plugs to Deans® Ultra® male
GPMM3149	Charge lead – banana plugs to micro connector
HCAP0101	Futaba® J Tx and Rx charge leads
HCAP0104	Airtronics® / Sanwa® Tx and Rx charge leads
HCAP0105	JR® / Spektrum® Tx and Rx charge leads
HCAP0106	Hitec® Tx and Rx charge leads
HCAP0108	Charge leads – banana plugs to alligator clips
HCAP0110	9V-style Tx connector, Futaba-J Rx charge lead

Always connect the charge lead to the charger first. Then connect the battery to the charge lead. Always match polarities on the battery wires, charge leads and banana jacks - black connections to black (-), red connections to red (+).

DETERMINING BATTERY TYPE & SPECIFICATIONS

IMPORTANT: What is your battery's CHEMISTRY TYPE, RATED CAPACITY, AND RATED VOLTAGE? To avoid causing permanent damage to your battery, carefully read your battery's label and/or instruction sheet or consult your battery supplier and determine:

1. **TYPE:** Is the battery a nickel-metal hydride (NiMH), nickel-cadmium (NiCd), lithium-polymer (LiPo) lithium-ion (Li-Ion), or lithium-ferriite phosphate (LiFe, such as A123 brand)?
2. **RATED CAPACITY:** The amount of charge energy the battery can store should be listed on the battery's label in "mAh" ("milli-amp hours").
3. **VOLTAGE:** If not printed on the battery's label, consult your battery supplier or determine the proper pack voltage as follows (refer to the charts at right):

- a. NiMH and NiCd: number of cells x 1.20.
- b. LiPo batteries: number of cells x 3.70.
- c. Li-Ion batteries: number of cells x 3.60.
- d. LiFe batteries (A123): number of cells x 3.30.

Battery Voltage Chart	
Number of cells	Rated Nominal Voltage
4 cells	4.8V
5 cells	6.0V
6 cells	7.2V
7 cells	8.4V
8 cells	9.6V

LiPo, Li-Ion and LiFe Pack Voltages	
Number of cells	Nominal voltage
1 cell	LiFe 3.3V
	Li-Ion 3.6V
	LiPo 3.7V
2 cells	LiFe 6.6V
	Li-Ion 7.2V
	LiPo 7.4V
3 cells	LiFe 9.9V
	Li-Ion 10.8V
	LiPo 11.1V

GETTING STARTED

1. Connect the charger to input power.
2. The **"START"** screen will show after power is applied. The top line of this screen will show which of the ten memories is active (0-9). All settings for this memory will scroll across the bottom line of this screen. If these settings match your battery and needs, skip to the STARTING CHARGE section.
3. If the settings in the displayed memory do not match your battery or needs, refer to the chart below for the factory default settings for all memories. To select one of these memories, while in the **START** screen press the CHANGE button. The memory number will flash. Press + or – to select a different memory number. Press CHANGE to activate this memory. Skip to the STARTING CHARGE section.

MEMORY CHART – FACTORY DEFAULTS

MEMORY NUMBER	0	1	2	3	4	5	6	7	8	9
Battery type	NiMH	NiCd	NiMH	NiCd	NiMH	NiMH	LiPo	LiPo	LiPo	LiPo
Cell count	6	6	6	6	4	4	2	2	2	2
Capacity (mAh)	4200	1800	2500	1500	1400	2000	650	1500	3200	1500
Current	6.0A	4.0A	4.0A	3.5A	1.4A	2A	0.6A	1.5A	3.2A	1.5A
Safety time (minutes)	50	32	45	31	72	72	130	120	120	120
Δ Peak (mV/C)	8	10	8	10	8	8	x	x	x	x
Trickle current (mA)	auto	200	200	175	70	100	x	x	x	x

4. If none of the memories have settings which meet your needs, proceed to the ADJUSTABLE SETTINGS section below to change settings manually.

ADJUSTABLE SETTINGS

1. Select the memory (0 through 9) that you wish to modify as explained on the previous page.
2. Press ► to find the “BATT SETUP” screen.
3. Press ▼ to move down to the BAT.TYPE screen. Press CHANGE to cause the setting to flash, then press (+) or (-) to find the desired battery type. Press CHANGE to confirm the new setting.



WARNING!! NEVER set the BAT.TYPE screen to a type that does not match your battery! For example, accidentally charging a LiPo battery in the NiCd setting could result in an overcharge condition on the battery, which could result in an intense FIRE!

4. Press ▼ to find the CELL [6] screen, to set the number of cells / nominal rated voltage of the battery. The number of cells in the pack is shown on the top line, and the nominal rated voltage of the pack will show on the bottom line. Press CHANGE to cause the setting to flash, then press (+) or (-) to find the setting which matches your pack..



WARNING!! For LiPo and Li-Ion batteries, NEVER set the voltage to a value which is higher than the rated voltage printed on the battery! Attempting to charge such a battery to a voltage that is higher than its rating could result in an overcharge condition on the battery, which could result in a very intense FIRE!

5. Press ▼ to find the CAPACITY screen. If the charger fails to detect full charge, this function can stop the charge process after a certain amount of energy (mAh) has been delivered to the battery. This protects the battery from accidental overcharge.



WARNING!! For LiPo, Li-Ion, and LiFe cells, always set the value in this screen to the exact rated capacity of the battery (or as close as possible). Lithium battery types can EASILY BECOME DAMAGED if overcharged and possibly START A FIRE! NEVER set the number in this screen to a value higher than the capacity (mAh) value printed on the lithium battery.

Setting this screen to 110-130% of a NiCd or NiMH battery's rated “mAh” value is recommended. As shown in the quick reference chart at right, locate the rated capacity of your battery in the left column, then find your battery's 110% or 130% capacity value to the right. Enter the desired capacity value into this screen.

NiCd and NiMH Only Max. Charge Capacity Chart		
Battery's Rated capacity (mAh)	110% Setting	130% Setting
700	800	900
1000	1100	1300
1100	1250	1450
1200	1350	1550
1500	1650	1950
1600	1750	2100
1700	1900	2200
1800	2000	2350
1900	2100	2450
2000	2200	2600
2100	2350	2750
2500	2750	3250
3000	3300	3900
3300	3650	4300
3600	3950	4700
3800	4200	4950
4200	4650	5450
4600	5050	6000
5000	5500	6500

Press CHANGE to cause the setting to flash, then press (+) or (-) to find the proper capacity value (as close as possible). Press CHANGE to confirm the new setting.

6. Press ▼ to find the fast charge CURRENT screen:

a. For **lithium** based batteries, the charger will automatically set the charge current to a value of 1C (based on the value entered in the CAPACITY screen described above). This can be overridden manually, but cannot exceed a value of 2C.

b. For **NiCd** and **NiMH** batteries, refer to the chart at right for recommended currents, based on the size of your battery shown in the left column. **Note:** If applying a slow charge to the battery as shown in the chart at right, it will be necessary to set the S_TIMER function to “off” (see next page).

NiCd and NiMH Battery Charge Current Chart				
Battery's rated (mAh)	Slow charge		1hr. charge	Quick charge
	current	charge time	current	current
700	0.1A	9-10 hours	0.7A	1.0A
1000	0.1A	13-15 hours	1.0A	1.2A
1100	0.1A	14-16 hours	1.1A	1.3A
1200	0.1A	16-18 hours	1.2A	1.4A
1500	0.2A	9-11 hours	1.5A	3.0A
1600	0.2A	10-12 hours	1.6A	3.2A
1700	0.2A	11-13 hours	1.7A	3.4A
1800	0.2A	12-13 hours	1.8A	3.6A
1900	0.2A	12-14 hours	1.9A	3.8A
2000	0.2A	13-15 hours	2.0A	4.0A
2100	0.2A	14-16 hours	2.1A	4.2A
2500	0.3A	11-12 hours	2.5A	4.5A
3000	0.3A	13-15 hours	3.0A	5.0A
3300	0.3A	14-16 hours	3.3A	5.0A
3600	0.4A	11-13 hours	3.6A	5.0A
3800	0.4A	12-14 hours	3.8A	5.0A
4200	0.4A	14-16 hours	4.2A	5.0A
4600	0.4A	15-17 hours	4.6A	5.0A
5000	0.5A	13-15 hours	5.0A	5.0A

Note: Turn S_TIMER “off” for slow charges

- c. To change the setting, press CHANGE to cause the setting to flash, then press (+) or (-) to find the proper capacity value. Press CHANGE to confirm the new setting. Do not exceed the maximum rated charge current for the battery.
7. Press ▼ to find the S_TIMER screen. This is a backup safety timer designed to automatically stop fast charge if the battery has not reached full charge in a reasonable amount of time. The charger will automatically calculate and set this time in minutes based on the values entered in the current and capacity screens above.
- To **manually** adjust this value, press CHANGE to cause the setting to flash. Press (+) or (-) to adjust the value. Press CHANGE again to confirm the setting. Do not increase this value so far that the charger no longer offers overcharge protection.
8. Press ▼ to find the Δ PEAK V screen (NiCd and NiMH batteries only). This “peak sensitivity” function determines how well the peak detection circuit will fill the battery. Settings of 8-10mV for NiCd batteries, and 3-7mV for NiMH batteries are recommended. Lower values usually result in more precise peak detection, but unstable input power sources could cause the charger to errantly stop peak charge too early. Larger values could cause the battery to generate a little extra heat during charge, and result in slightly less accurate peak charges.
9. Press ▼ to find the TRICKLE charge current screen. This is the amount of trickle charge current that will be applied only to NiCd or NiMH batteries after peak charge has ended. The charger will automatically set this value based on the fast charge current setting divided by 20. This setting can be manually changed if desired. Setting this to “0mA” effectively turns this feature off. For “A”, “AA”, “AAA” size Tx or Rx batteries, it is not recommended to set the trickle current to larger than 50mA. Trickle charge is never applied to lithium batteries.

Once you’ve customized a memory to match your battery, the charger will memorize these settings until changed again manually. For easy reference, record your settings for each memory in the blank chart below.

After settings have been adjusted, press ▲ repeatedly to find the BATT SETUP screen, or press ► to find the START screen.

BLANK MEMORY CHART

MEMORY NUMBER	0	1	2	3	4	5	6	7	8	9
Battery type										
Cell count										
Capacity (mAh)										
Current										
Safety time (minutes)										
Δ Peak (mV/C)										
Trickle current (mA)										

If you wish to reset all settings in the charger back to the factory defaults, disconnect the charger from input power. Press and hold the ► button on the right, then connect the charger to input power again. **Do NOT perform this reset if you do not wish to clear all settings in the memories!**

USER SETUP SCREENS

As shown in the programming flowchart, while in the START screen press ► twice to find the USER SETUP screen. Adjusting the charger’s audible tones and melodies is done here.

- Press ▼ to find the MELODY screen. To change, press CHANGE, and then (+) or (-) to select from 5 different tones, or turn off. Press CHANGE again to confirm.
- Press ▼ to find the BEEP screen. To turn on or off the beeper, press CHANGE, then (+) or (-). When turned on, the beeper will sound anytime a button is pressed. Press CHANGE again to confirm.

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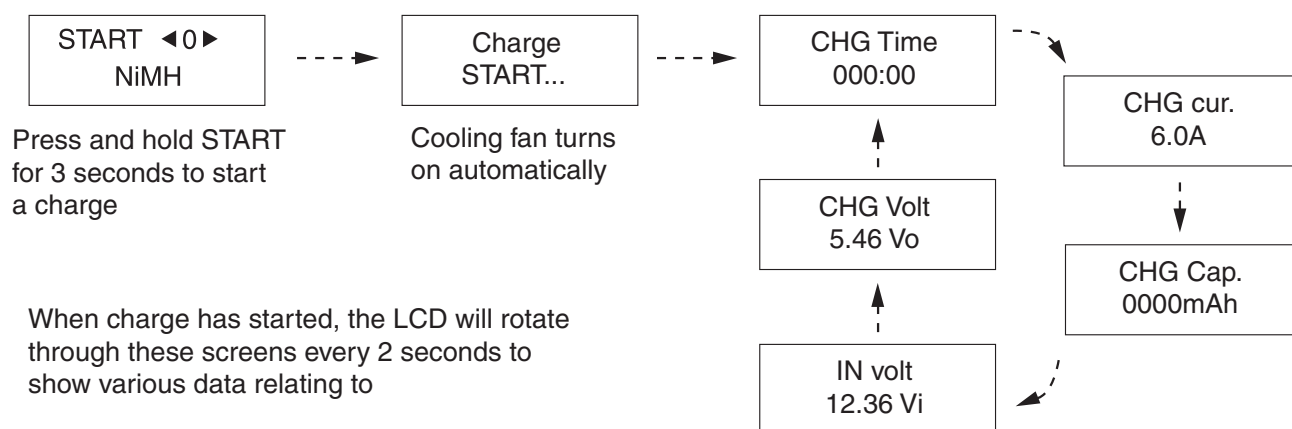
VIEW DATA SCREENS

While in the START screen press ► three times to find the VIEW DATA screens. The charger can display several types of input, output, and battery data in these screens, as follows:

1. Press ▼ to find the INPUT V screen. This is the DC voltage measured on the charger's input. Even if connected to an AC input, that voltage is converted to a DC voltage inside the charger and will be displayed in this screen.
2. The OUTPUT V screen shows the DC voltage measured on the charger's output.
3. The PEAK V screen shows the highest measured battery voltage during the last charge.
4. The CAPACITY screen shows how much charge energy was delivered to the battery during the last charge.
5. The CHG TIME screen shows how many minutes the charger delivered a charge to the battery. This does not include any time that a trickle charge was delivered.
6. Press ► to return to the START screen.

STARTING CHARGE

1. Press ► until the START screen is found. **This screen must be showing in order to start a charge.**
2. Press and hold the START button for 3 seconds to start charging the battery. The charger will then display several types of information during the charge process like shown below:



For **NiCd** and **NiMH batteries**, a linear charge current will be delivered to the battery. The peak detection method will be used to accurately look for the highest battery voltage during charge. Once this is detected, the charger will automatically stop fast charge and go to trickle charge mode.

Caution: Make sure the charge current setting is safe for your battery to prevent overheating of the cells. “AAA”, “AA”, “A”, and “2/3A” size batteries generate heat more quickly than large sub-C batteries. Most radio batteries should NOT be charged at currents greater than 1.5A. Failure to follow this recommendation could permanently damage your battery.

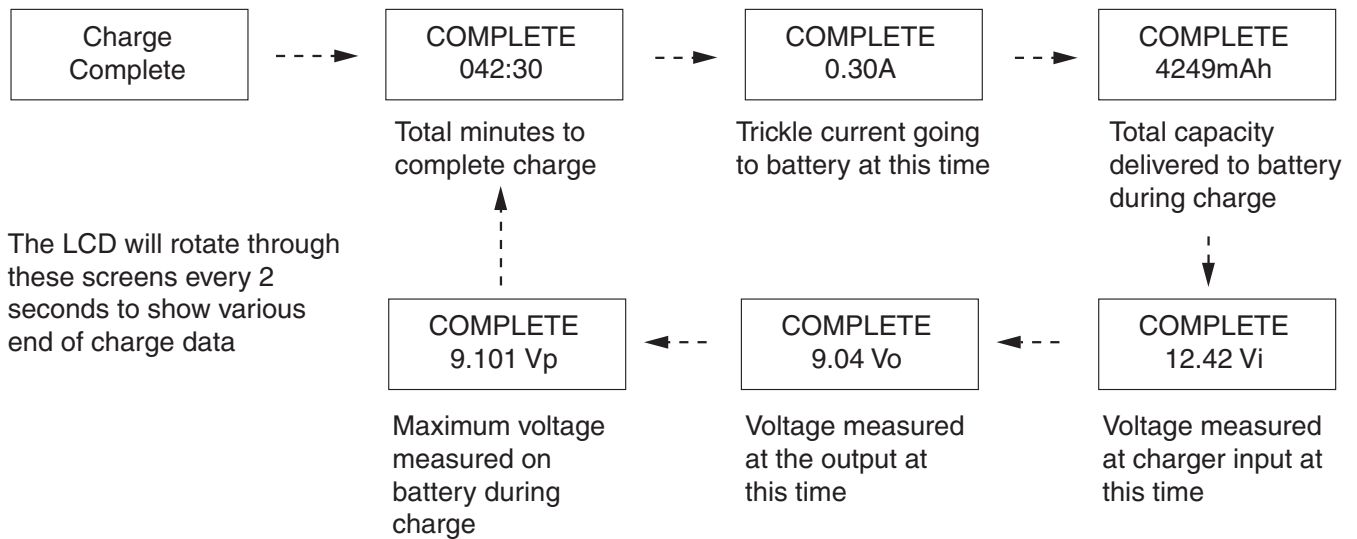
The constant-current / constant-voltage (cc/cv) method is used to fully charge **lithium batteries**. This method is much different than the peak detection charge method for NiCd batteries. In the early stages of charge, the charger will attempt to deliver the set amount of current to the battery – **unless** the charger determines that the current should be reduced based on the condition of the battery. Later, after the battery reaches a certain voltage per cell (4.10V for LiPo, 4.00V for Li-Ion, and 3.50V for LiFe), the charger will stop trying to force the current at a constant level and instead apply a constant voltage. **You will see a considerable reduction in output current at this time. This is normal.** When current to the battery drops to approx. 80-100mA, the charger will automatically stop charging the battery.

When the “CHG Volt” screen shows the voltage of the battery during charge, the loading affect of the charger will skew the voltage reading of the battery, which is normal. A higher current will skew the reading more than a smaller current. Voltage readings taken when charge is finished will more accurately show the true voltage of the battery.

To manually stop a charge while in progress, either disconnect the battery from the charger, or press START.

CHARGE COMPLETE

When the charger has determined that the battery is full and fast charge ends, audible tones will sound for about 10 seconds and a new set of screens will show final results of the charge process like below:



For NiCd and NiMH batteries, the charger will automatically apply a trickle charge to the battery when peak charge ends, shown in amps “A” on-screen. A trickle current of 200mA will be displayed as “0.20A”. A trickle current of 50mA will be shown as “0.05A”, etc. The charger will remain in trickle charge mode until the battery is disconnected, or the START button is pressed.

Trickle charge will NOT be applied to lithium batteries. When fast charge ends, lithium batteries can be disconnected from the charger and are ready for use.

If the fast charge backup safety timer expires before the battery is fully charged, the display will show “TIMEOUT”. If this occurs, you might want to attempt to re-peak the battery by starting another charge. Refer to the Troubleshooting Guide for more details.

To exit the CHARGE COMPLETE screens, press ► to find the START screen. Then, pressing ► until the VIEW DATA screen is found will show all data relating to the last charge that was performed.

CARE & HANDLING OF NiMH BATTERIES

- Do not allow NiMH batteries to overheat! Disconnect overheated batteries from the charger immediately and allow to cool.
- Do not attempt to use the charger’s lithium functions with NiMH batteries.
- Store NiMH packs with some voltage remaining on the cells (refer to battery supplier).
- It is important to recharge NiMH batteries immediately prior to use, as they have a high self discharge rate.
- “AAA”, “AA” and “A” size radio batteries can safely be peak charged at currents up to 1.5C to 2C (battery capacity x 1.5 or 2.0). High charge currents can overheat batteries and thus reduce service life, especially for smaller size cells.

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CARE & HANDLING OF LiPo, Li-Ion & LiFe BATTERIES



WARNING!! DO NOT try to charge lithium-polymer (LiPo) or lithium-ion (Li-Ion) 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 its 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.
- **NEVER** attempt to extinguish a lithium fire with water or a non-lithium approved fire extinguisher!
- **ALWAYS** provide adequate ventilation around LiPo/Ion batteries during charge, while in use, and during storage.
- **NEVER** allow LiPo or Li-Ion 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 or Li-Ion 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** set the charger's LiPo/Ion battery voltage settings to a voltage that is **HIGHER** than the nominal rating of the battery itself, as such cells cannot handle overcharging in any way.
- **NEVER** charge LiPo or Li-Ion batteries at currents greater than the "1C" rating of the battery, or 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 or Li-Ion 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!
- **NEVER** attempt to use the charger's NiCd and NiMH functions for LiPo or Li-Ion batteries.
- **ALWAYS** keep LiPo batteries away from children.

BATTERY STORAGE

NiCd, NiMH, LiPo, and Li-Ion cell manufacturers recommend applying a 40% full charge to the batteries before being put in storage. To achieve this, setting the CAPACITY screen to a reduced level before charge will cause the charger to deliver only a partial charge to the battery.

Multiply your battery's rated capacity by 0.4 to find the proper value. Enter this value (or the closest available value) into this screen. For example: The 40% full charge capacity of a battery rated at 3200mAh would be (3200 x 0.4) 1280mAh. The closest possible setting for this would be 1300mAh. The 40% full charge capacity of a battery rated at 1600mAh would be (1600 x 0.4) 640mAh. The closest possible setting for this would be 650mAh.

Once this value is set, proceed to charge the battery. When charge ends, you should notice that only about 40% of the battery's rated capacity was delivered during charge by looking at the COMPLETE screen as explained above.

COOLING FAN

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. The fan only functions while a battery is being charged. **CAUTION: Do not block the vent holes for the cooling fan on the left side of the charger. Failure to do so could cause the charger to overheat and possibly cause permanent damage.**

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ERROR MESSAGES & TROUBLESHOOTING GUIDE

Several safety features are included in this charger to protect itself and the battery against certain unwanted conditions, as follows:

LCD MESSAGE	PROBLEM AND SOLUTION
“Input V Error”	The input voltage is below 11.0V or exceeds 15V DC. Make sure the input voltage is within the acceptable range.
“No Battery”	A battery is not connected to the output. Make sure a good connection exists between the battery and charger and re-try.
“Wrong Polarity”	The battery is connected backwards to the charger’s output. Re-connect the battery to the charger’s output with the proper polarity.
“Open Circuit”	The battery has become disconnected during charge. Re-establish a good physical connection between the battery and charger, and re-start charge.
“Circuit Error”	Some type of electronic interruption or malfunction occurs. If you believe that some external force might have caused the charger to err, and that a true circuit malfunction has not occurred, you might attempt to re-start charge. Otherwise, if you believe the charger is not functioning properly, disconnect the battery from the charger, and the charger from input power, and contact Hobby Services for further details.
“Bat.Volt Error”	Shows if the charger measures the voltage of the battery to be lower – or higher - than the number of cells set in the charger for the respective battery. Re-confirm the number of cells in your battery, and make sure the charger is set to the proper battery type. If the charger is set to the proper setting, it’s possible that the battery might have been discharged to too low of a voltage and may no longer be suitable for use. Contact Hobby Services for further details.
“Timeout”	The backup safety timer expired before full charge was detected.

Other possible problems:

PROBLEM – LCD does not work when unit is connected to input power: Check power supply for improper power. Check input connections for solid contact. DC input power might be connected backwards...reverse input connection. Contact Hobby Services for further details.

PROBLEM – Battery voltage low after charge (below 1.2V per cell for NiCd/MH, 3.3V for LiFe, 3.6V for Li-Ion, or 3.7V for LiPo batteries): The capacity setting, charge current setting, and/or backup safety timer settings are too low. NiCd/MH peak sensitivity setting might be too low or too high...re-adjust setting. Perhaps poor quality charge leads...replace with new.

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5-YEAR LIMITED WARRANTY – *U.S.A. & 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:

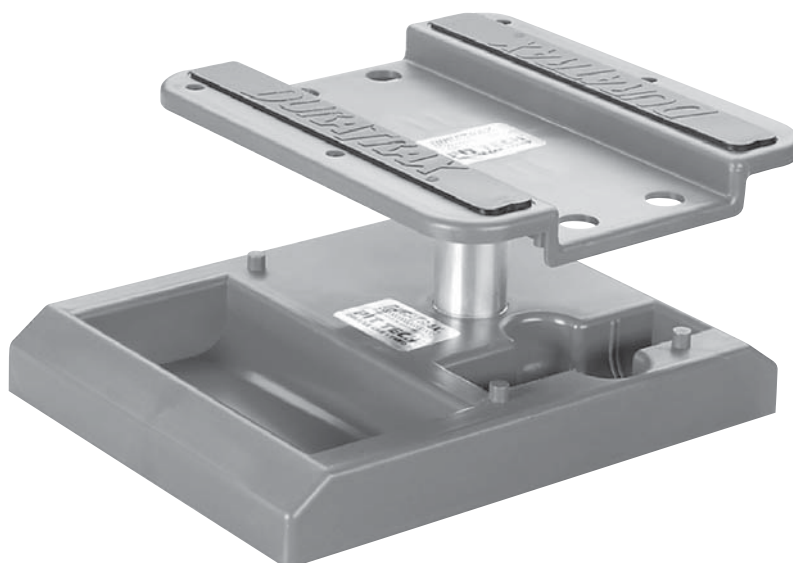
HOBBY SERVICES
3002 N. Apollo Drive, Suite 1
Champaign, IL 61822
(217) 398-0007
www.hobbyservices@hobbico.com

*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.



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OTHER ITEMS AVAILABLE FROM DURATRAX



DuraTrax Pit Tech™ Deluxe Car Stand

This convenient workstation for R/C cars and trucks features a rotating top plate for easy access from all sides and a dropped center section that provides a stable work platform for models with uneven chassis bottoms. Includes an extra-large parts tray and built-in holes to keep shocks handy when rebuilding. **DTXC2370**



DuraTrax Ultimate Tool Set w/Pouch

DuraTrax Ultimate tools have hardened steel tips plus a blue-anodized aluminum handle that's knurled for a no-slip grip. This set has 'em all – 4 each of metric and SAE hex drivers, 3 each of slotted and Phillips screwdrivers – plus an Ultimate Body Reamer. And to keep them handy and organized, DuraTrax includes a 15-pocket, book-style tool pouch with zipper. **DTXR0400**

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Programming Flowchart

