

OPERATING INSTRUCTIONS

DIGI PEAK+



DIGI-PEAK & DIGI-PEAK PLUS
Part #4400, 4410, 4450, & 4460



INTRODUCING THE DIGI-PEAK

The DIGI-PEAK and DIGI-PEAK PLUS chargers are constant-current chargers designed to charge 4 to 8 cell nickel-cadmium battery packs from a 10 to 18 volt DC power source.

The DIGI-PEAK chargers feature 10-bit Digital Peak-Detection Circuitry™ with automatic shut-off. Three different charging modes allow you to fine-tune the charging. PULSE Mode with 0 to 10 amps, LINEAR Mode with 0 to 5.0 amps, and TRICKLE Mode with 0 to 300 milliamps linear trickle charge. A built-in LCD meter on the DIGI-PEAK PLUS, and output jacks for an external voltmeter on the DIGI-PEAK, let you monitor battery pack voltage.

DIGI-PEAK chargers are equipped with Solid State RVP™, thermal overload protection, and heat sink temperature sensing auto-fan circuitry to control the optional cooling fan Kit #5635.

SPECIFICATIONS

Charging Capacity	4 to 8 cells (1.2 volts DC/cell)
Peak Detection	10 bit digital
PULSE Mode Charging Rate	0 to 10 amps (adjustable, ±10%)
LINEAR Mode Charging Rate	0 to 5 amps (adjustable, ±10%)
TRICKLE Mode Rate (Linear only)	0 to 300 milliamps (adjustable, ±10%)
Power Source Input	10 to 18 volts DC
Lock-Out Time	100 seconds
Reverse Voltage Protection	Solid State RVP™ (Input and Output)
Overload Protection	Thermal
Size (Width x Depth x Height)	4.00" x 7.10" x 2.72"
Input Connector (Source)	Associated (6 ft zip cord w/alligator clips)
Output Connector (Battery)	Alligator Clips (12 inch)

**NOTHING
CHARGES
LIKE A
NOVAK!**

IMPORTANT PRECAUTIONS

The following precautions will help to prevent possible damage to the charger, battery pack, and the input power source.

- Charge only nickel-cadmium rechargeable battery packs. Nickel-cadmium batteries can become damaged if the charging current used is too high. Maximum charging rates can be obtained from the battery manufacturer. Do not trickle charge at a rate higher than 20% of the cell's rated mAh capacity for longer than two hours.
- Never allow water, moisture, or other foreign materials to enter the charger.
- Automobile battery chargers should not be used to power the charger. False peaks can occur, and excessive voltage spikes can damage the charger.
- Do not charge battery packs with less than 4 or more than 8 cells connected in series.
- The heat sink on the back of the charger can get extremely hot during charging. Do not obstruct or cover the heat sink or cooling fan (if equipped), as this will cause it to overheat and shut down. When charging 4-cell packs, the DIGI-PEAK's heat sink will get very hot. If the heat sink gets too hot, the charger will go into thermal shutdown mode.
- To help cool the heat sink, use the optional Novak Cooling Fan Kit #5635. The charger's Auto-Fan circuitry only runs the cooling fan when needed. (Fan cycling on and off is normal)
- Never use an input power source which exceeds 18 volts DC to power the charger.
- Avoid open flames and sparks which may ignite battery gases. Always disconnect the zip cord from the charger before connecting or disconnecting the alligator clips to a lead-acid battery. Using a lead-acid battery as a power source generates hydrogen gas and should only be used in a well ventilated area, as gases built up may ignite if sparks occur.

PLEASE FOLLOW ALL INSTRUCTIONS CAREFULLY

POWER SUPPLY REQUIREMENTS

As a general rule, the voltage of the input power source should be 1.5 volts DC above the peak-voltage of the battery pack you are charging.

Example: (8 cell transmitter pack peak-voltage* = 13.5 volts) + (1.5 volts) = 15 volts DC

*Older battery packs will peak at higher voltages—Do not exceed 18 volts DC input voltage

ACCEPTABLE POWER SUPPLIES	UNACCEPTABLE POWER SUPPLIES
Car Battery	12 volts DC
Power Supply	10 to 18 volts DC
	Automotive Battery Charger

SELECTING CHARGE MODE & RATE

The DIGI-PEAK chargers have three adjustable charge modes (LINEAR, PULSE, and TRICKLE) for charging nickel-cadmium rechargeable battery packs. The following table lists typical charging rates and recommended charging modes for popular cells used in the remote control industry. While higher charging rates will peak your cells sooner, use of excessive charging rates (above those listed below) may damage your batteries.

BATTERY PACK TYPE	CHARGING RATE	CHARGING MODE
SCRC cells	3.0 to 6.0 amps	LINEAR
SCE, P-170, and P-180 cells	2.0 to 3.5 amps	LINEAR
SCR cells (except Panasonic)	3.0 to 6.0 amps	LINEAR or PULSE
Receiver Battery Pack (50 mAh)	0.5 amp	LINEAR (Only)
Transmitter Battery Pack (AA)	0.5 to 1.5 amps	LINEAR
TRICKLE CHARGE	CHARGING RATE	CHARGING MODE
SCRC, SCE, P-170, and P-180 cells	170 milliamps	LINEAR (Only)
SCR cells	140 milliamps	LINEAR (Only)

STEP 3 SELECT THE CHARGING MODE

Determine the proper charging mode from table above. Slide the LINEAR / PULSE mode select switch to either LINEAR or PULSE. Refer to illustration in Step 4

The charger runs hotter in the more common LINEAR charging mode and may require the optional Novak Cooling Fan Kit #5635 if overheating occurs. The PULSE mode will allow higher charging rates and cooler operating temperature, which can be used if the charger overheats in the LINEAR mode. Please note that charging rates higher than 5 amps may decrease the number of useful cycles in the life of the battery pack.

TRICKLE CHARGING

Trickle charging is only available in the LINEAR mode and can be used to slow charge the battery or equalize the cells in the battery pack. When the battery pack is connected and the charger is in the LINEAR mode, it will automatically begin trickle charging until the START button is pressed. When the battery pack peaks in the LINEAR mode, the charger will again automatically trickle charge the pack. If the TRICKLE dial is set to zero, no trickle charging will take place either before or after the charge cycle.

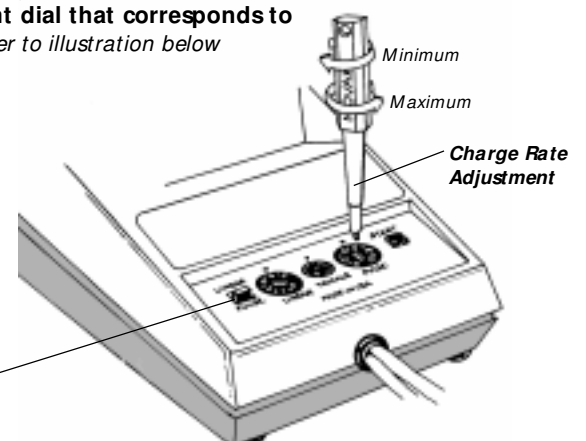
ADJUSTING THE CHARGE RATE

STEP 4 ADJUST THE CHARGING RATE

Determine the proper charging rate from table above. Rotate the current adjustment dial that corresponds to the charging mode used. Refer to illustration below

Use the enclosed screwdriver or a small flat blade screwdriver to make this adjustment.

Current dials are ±10% accurate

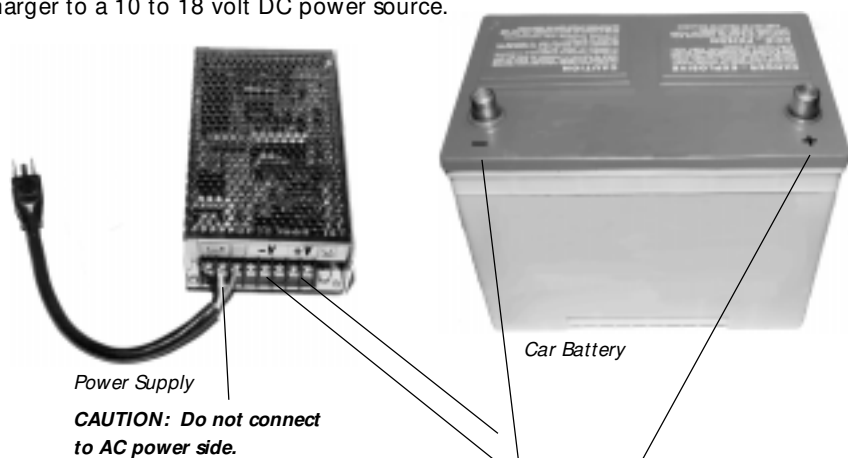


DIGI-PEAK SET-UP

Refer to the back page for more information.

STEP 1 CONNECT INPUT

- Connect the input alligator clips on the back of the charger to a 10 to 18 volt DC power source.



Power Supply

CAUTION: Do not connect to AC power side.

Car Battery

STEP 2 CONNECT OUTPUT

- Connect the output alligator clips on the front of the charger to a 4 to 8 cell nickel-cadmium battery pack. (1.2 volts DC/cell)



Red = Positive

Black = Negative



NOVAK ELECTRONICS, INC.
18910 Teller Avenue
Irvine, CA 92612



DETAILED INFORMATION

DIGI-PEAK OPERATION

TO START CHARGING

1. Connect charger as shown in STEP 1 and STEP 2 on front of instructions.
2. Adjust charging current as described in STEP 4 on front of instructions.
3. Press and hold the START button until LED is lit.

Once the DIGI-PEAK charger starts charging, there is a **100 second lock-out time**, during which the charger will ignore voltage peaks and will not shut off. *Be careful how many times you repeak the battery pack, as the battery pack voltage will continue to drop during the lock-out and may damage the battery pack.* After the lock-out time, the DIGI-PEAK's peak detection circuitry is active. When the battery voltage peaks and begins to drop, the charger will shut off and the LED will go out (or flash, if trickle rate is set above zero in the LINEAR mode). At this time, the batteries will be warm to the touch, and are fully charged and ready to run.

TO STOP CHARGING Disconnect the battery pack from the output alligator clips. *Remember that the 100 second lock-out time is reset to zero whenever the charger is started.*

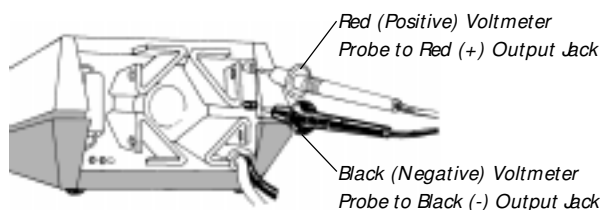
PACK VOLTAGE

If you are using the **DIGI-PEAK PLUS** version charger, turn on the LCD display and select VOLTS on the meter slide switch to monitor the battery pack voltage. During the charge cycle, the LCD meter will display the voltage of the battery pack. If the charger is not connected to a power source and is connected to a battery pack, the LCD will display the battery pack voltage. If you are in the LINEAR mode with the charger connected to an input power source and no battery pack connected, the LCD will display the approximate input voltage.

If you have the **DIGI-PEAK** version without the built-in LCD display, you can connect an external voltmeter to the charger to monitor the battery pack voltage during the charge cycle.

MONITOR BATTERY PACK VOLTAGE USING A VOLTMETER

1. Set the voltmeter to the 20 volt DC range.
2. Insert the RED (Positive) voltmeter probe into the red (+) output jack located on the back of the charger, and insert the BLACK (Negative) probe into the black (-) output jack also located on the back of the charger. *Refer to illustration below*
3. The battery pack voltage is equal to that displayed on the voltmeter.



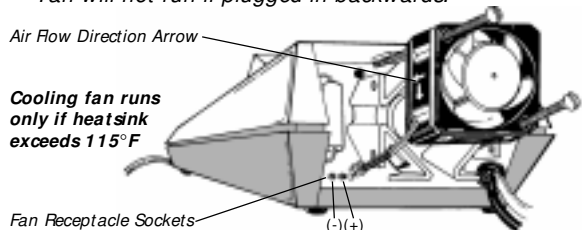
COOLING FAN

If you have purchased DIGI-PEAK or DIGI-PEAK PLUS chargers without the factory installed cooling fan, follow these steps to install the Novak Cooling Fan Kit #5635.

INSTALLING THE COOLING FAN

The Novak Cooling Fan is factory wired with a connector to plug directly into the DIGI-PEAK and DIGI-PEAK PLUS chargers, and includes two self-tapping screws to mount into existing holes in the back plate of the charger.

1. Locate the air flow & rotation direction arrows that are molded into the plastic housing of the cooling fan.
2. Mount fan with the air flow direction arrow pointing towards the back plate of charger. *Refer to illustration below*
3. Make sure the plug on the cooling fan wiring will reach the receptacle sockets on the lower left of the charger back plate. If needed, rotate the cooling fan.
4. Insert screw into upper left and lower right holes on cooling fan and through the openings of the heat sink into the pre-drilled holes in back plate. Screw into back plate with a screwdriver until screw heads just touch the fan housing. *Overtightening the fan screws will warp and damage the back plate.*
5. Insert plug from the cooling fan into the receptacle sockets on lower left of the back plate. The red wire should be closest to the heat sink for proper polarity. *Fan will not run if plugged in backwards.*



BATTERY TIPS

GETTING THE MOST OUT OF YOUR BATTERIES

Getting the most run time and the longest life from your batteries requires more than just charging at the correct current. Proper care is a must for your battery packs.

REPEAK FOR MAXIMUM CAPACITY

When the battery pack voltage peaks at the end of the charge and begins to drop, one or more cells are fully charged and start to 'self discharge'. The excess energy that is put into the cell after it has peaked results in the dissipation of heat. You may notice when the battery pack peaks, some of the cells get warmer than others. This is because charge times differ slightly from cell to cell.

A good way to reduce the problem of some cells having a more complete charge than others, is to repeak the battery pack after about 30 minutes. This allows the cells that have over-charged to discharge down to the level of the remaining cells in the pack. Repeaking after the cells have equalized with each other brings all the cells in the pack up together for maximum capacity. It is best to time this process so that you are able to run immediately after repeaking, this will minimize the 'self-discharging' of the batteries.

DISCHARGE FOR EXTENDED RUN TIME AND LONG LIFE

When you are done for the day, you should discharge your battery packs to prepare them for the next time you will use them. Storing and recharging a partially charged battery pack will result in decreased performance from your batteries, and will reduce the number of effective charge cycles you will get from your batteries.

The simplest method to discharge your batteries is to put a 30 ohm/10 watt resistor across the battery terminals **as shown below**. As the pack discharges, some of the cells will become reversed (the cell voltage becomes negative) and will charge backwards. Charging a cell backwards at high rates will damage the cell. However, the current drawn through a 30 ohm resistor is low enough for the cell to tolerate without damage. Connect the resistor to the battery until the resistor cools to room temperature. This may take several hours. Remove the resistor from the battery pack at this time. **Damage to the battery pack can also occur if the resistor remains attached to the pack for a time period longer than 24 hours.**

Discharging Battery Pack



30Ω / 10W Resistor

- **Always discharge your battery packs after using them to get the maximum performance and longest battery life.**

PRODUCT WARRANTY

Novak Electronics, Inc. guarantees the DIGI-PEAK and DIGI-PEAK PLUS chargers to be free from defects in materials or workmanship for a period of 90 days from the original date of purchase (verified by dated, itemized sales receipt). This warranty does not cover components worn by use, damage due to charging more than 8 or less than 4 cells, damage to battery packs resulting from improper connection or charging of a receiver battery pack, any splices to the input or output wires, components damaged from excessive force when pressing the **START** button or over-rotating the current adjust dials, disassembling the case, tampering with the internal electronics, allowing water, moisture, or any other foreign material to enter charger or get onto the PC board, or allowing and exposed wire to short-circuit.

In no case shall our liability exceed the product's original cost. We reserve the right to modify the provisions stated in this warranty without notice.

Because **Novak Electronics, Inc.** has no control over the connection and use of the charger, no liability may be assumed nor will liability be accepted for damaged resulting from the use of this product. Every charger is thoroughly tested before leaving our facility and is, therefore, considered operational. By the act of connecting or operating this charger, the user accepts all resulting liability.

CUSTOMER SERVICE

CUSTOMER SERVICE HOURS (PST)

Monday-Thursday: 8 a.m. - 5 p.m.

Friday: 8 a.m. - 4 p.m. (Closed every other Friday)

(949) 833-8873 • FAX (949) 833-1631

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Printed in the U.S.A. (8/99) #IM-4400-4

TROUBLE-SHOOTING GUIDE

This section describes typical charger problems, causes, and solutions. If you are unable to solve the problem, call our Customer Service Department for assistance.

Charger Stops Before Battery Pack Is Fully Charged

- Input power supply is unstable. Connect the charger input to a 12 volt DC automobile battery to check.
- The battery pack has one or more bad cells in it. Try charging different battery packs. Monitor battery pack voltage while charging. If voltage starts to drop before the charger shuts off, charger is operating normally.
- Charging current is too high. If charge current is too high for the battery pack, it will heat up prematurely and cause the voltage to drop, shutting off the charger. Reduce the charge current.
- Try charging using the LINEAR mode. Some battery packs will not accept PULSE charging at higher charge rates and will peak before the battery is fully charged.
- The charging current was lowered while charging after the lockout time expired. Press the **START** button to restart the charge cycle.
- Poor connection to the input power source or battery pack. Check, clean, and tighten all connections.
- Charger has over-heated and has thermally shut down. (See Below)

Charger Stops And Will Not Restart

Thermal Shut-Down has occurred—Try Novak Cooling Fan Kit #5635

- Cooling fan (if equipped) is not running. Fan should run whenever the heat sink temperature rises above 115°F. Make sure fan is not plugged in backwards.
- Charger input voltage too high or charge current set too high. Reduce input voltage to 1.5 volts DC above the peak-voltage of the battery pack being charged or reduce charge current. This more commonly happens when charging 4 cell packs at too high of a current.

Charger Will Not Start

- Charger has thermally shut down and is cooling off. Charger can be restarted after a few minutes when the proper operating temperature has been reached.
- Bad connection in charging circuit. Check input/output connections. Try charging a different battery pack.

Charger Stays On But Battery Pack Does Not Charge

- Input voltage too low. Input voltage to the charger should be at 1.5 volts DC above the peak-voltage of the battery pack being charged.
- Charge current set too low. Increase current.

Charge Current Will Not Adjust Properly

- Input voltage too low. The input voltage to the charger should be 1.5 volts DC above the peak-voltage of the battery pack being charged.

Charger Appears To Be Trickling

- The charge indicator LED will flash whenever the charge current is below approximately 0.30 amp. The charger is operating normally.

Charger Starts When First Connected To Battery Pack

- The 100 second lockout period of the charger is active. Re-press the **START** button to ensure proper startup.

SERVICE PROCEDURES

Before sending in your DIGI-PEAK or DIGI-PEAK PLUS charger for service, review the Trouble-Shooting guide and the instructions. The charger may appear to have failed when other problems exist.

PLEASE NOTE: DIGI-PEAK & DIGI-PEAK PLUS chargers that operate normally when received will be charged a minimum service fee and return shipping costs.

WHAT TO SEND: Fill out all of the information requested on the enclosed **CHARGER SERVICE CARD** and return it with your charger.

WARRANTY WORK: For warranty work, customer MUST CLAIM WARRANTY on the **CHARGER SERVICE CARD** and include a valid cash register receipt with purchase date on it, or an invoice from previous service work for the charger. If any warranty provisions have been voided there will be a service charge.

SERVICE COSTS: Customer is responsible for all service costs (Parts, labor, and shipping/handling charges). Chargers returned UPS/COD CASH ONLY. See **CHARGER SERVICE CARD** for other payment and shipping options.

ADDITIONAL NOTES:

- Hobby dealers/distributors are not authorized to replace chargers thought to be defective.
- If a hobby dealer sends your charger in for service, be sure to submit a completed **CHARGER SERVICE CARD** to the dealer and make sure it is sent with the charger.
- To provide the most efficient service possible to our customers, it is not out policy to contact customers by phone or mail.
- Novak Electronics does not make any electronic components (transistors, resistors, fans, etc.) available for sale.

SEND CHARGERS TO:

NOVAK ELECTRONICS, INC.
18910 Teller Avenue
Irvine, CA 92612

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